Regional Energy and Trade Laws in South Asia

Volume II

Prepared by

Nexant

Contract No. 386-C-00-03-00135-00

Prepared for

USAID SARI/Energy Program

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The governments of India, Bangladesh, Nepal and Bhutan, each hereinafter referred to as "Member Country" or "Party" and, collectively, "Member Countries" or "Parties", agree as follows:

RECITALS

Considering that, within the framework of the South Asia Regional Initiative/Energy Program ("SARI"), the Parties have manifested the desire to initiate a gradual integration process of electrical power systems and clean fuel systems such as natural gas, through the use of the development of a competitive regional electrical power and natural gas market, by using transmission lines that will interconnect national networks, and the promotion of regional electrical generation and natural gas supply projects ("South Asia Integration System" or "SAIS");

Aware of the fact that a regional electrical and gas market supported by an interconnection of the Parties' national electrical and gas systems would promote the development of the electrical and gas industry thereby benefiting all the inhabitants of the Member Countries;

Secure in the knowledge that the consolidation of a regional electrical and gas market shall allow increasing electrical and gas transactions, and will satisfy efficiently the needs of a sustainable development in the region of South Asia, within a framework of respect and protection for the environment; and

Keeping in mind that the Parties declared that, for regional electrical systems, promoting the development of the SAARC grid was a maximum priority.

The Member Parties have agreed to sign this Treaty for the South Asia Integration System ("Treaty") that shall be governed by the following:

OBJECTIVE OF THE TREATY:

ARTICLE 1 – The objective of this Treaty is to facilitate the formation and staged growth of a regional competitive electrical and gas regional market, hereinafter referred to as "the Regional Market", based on a reciprocal and non-discriminatory treatment that will contribute to a sustainable regional development, within a framework of respect and protection for the environment.

PURPOSE OF THE TREATY:

ARTICLE 2 – The purpose of this Treaty is:

a) Establish the rights and obligations of the Parties.

b) Establish conditions for growth within the Regional Market that will deliver in a timely and sustainable manner the necessary electricity and gas for economic and social development.

c) Encourage a greater and more competitive private participation in the electrical and gas sectors of the Member Countries.

d) Promote the necessary interconnection infrastructure for the development of the Regional Market.

e) Create the necessary conditions that will bring about acceptable levels of quality, reliability, and security in supplying electrical energy and gas in the region.

f) Establish objective rules that are transparent and non-discriminatory to regulate the administration of the regional electrical and market and relations among the participating regional market agents, one entity designated by each of the Parties ("Regional Market Agents"), as well as the creation of other appropriate regional entities with the intention of attaining these objectives.

g) Promote the benefits derived from a regional electrical and gas market so that they reach all of the inhabitants of the Member Countries.

PRINCIPLES THAT GOVERN THE TREATY:

ARTICLE 3 – The Treaty shall be governed by the principles of competition, progressive implementation and reciprocity, defined as follows:

Competition:

Freedom to develop activities related to providing services based on objective rules that are transparent and non-discriminatory.

Progression:

Precautions for the progressive evolution of the Regional Market by having new participants join, progressive increase of coordinated operations, development on interconnecting networks, and strengthening of regional organizations

Reciprocity:

The right of each Party to apply the same rules and regulations to another Party, which that Party applies temporarily according to the principle of progression.

REGIONAL ELECTRIC AND GAS MARKET

ARTICLE 4 – The market operates as a permanent activity for electrical and gas commercial transactions, with short-term interchanges derived from the delivery of electrical energy and gas with regional economic criteria and by the use of mid and long-term contracts among the Regional Market Agents. The Regional Market should evolve gradually from an initially limited situation towards a broader, open and more competitive one, supported by the existing and future national as well as regional infrastructure.

ARTICLE 5 – Regional Market activities shall be undertaken by the Regional Market Agents, which could include representatives of companies dedicated to generation, transmission, distribution or marketing of electricity and gas, as well as large consumers. Regional Market

Agents shall be able to freely and without discrimination carry out the purchase and sale of electrical energy and gas. However, while the legislation of a particular country allows for the same company to carry out two or more activities related to providing electrical and gas services, or designating just one company to perform transactions in the Regional Market, these companies should create separate business units that allow a clear identification of the cost of each activity. Participation of Regional Market Agents in the Regional Market shall be governed by rules, protocol, and regulations as contained in this Treaty.

ARTICLE 6 – The Parties shall endeavor for the Regional Market to evolve towards more competitiveness by carrying out joint evaluations at least every two years based on the recommendations of SARI through the formation of a Regional Committee for Electrical and Gas Interconnections. This organization is created in Article 18 of this Treaty.

REGIONAL GENERATION OF ELECTRICITY AND GAS SUPPLY:

ARTICLE 7 – Electrical and gas transactions shall be carried out by generators and suppliers of electrical and gas systems produced in the Regional Market and designated as Regional Market Agents.

ARTICLE 8 – Electrical generation and gas plants and facilities shall be installed in any of the Member Countries, while complying with the requirements demanded by the legislation of that Member Country.

ARTICLE 9 – Each Party shall establish conditions that are favorable for the development of regional electrical generation and gas plants and facilities, consistent with the efficient development of the Regional Market.

ARTICLE 10 – A regional operating entity ("Regional Operating Entity", or "ROE"), a regional organization created by Article 18 of this Treaty, in coordination with the Regional Committee for Electrical and Gas Interconnections, shall carry out the coordinated operations of the electrical and gas systems based on the criteria of an economic delivery.

REGIONAL TRANSMISSION

ARTICLE 11 – Regional transmission is considered to be the flow of electric energy and natural gas that crosses borders between countries, allowing Regional Market transactions by means of the existing systems and networks as well as those that will be constructed in the future.

ARTICLE 12 – The Regional Market Agents shall freely access regional as well as national transmission networks. Costs for the use and availability of regional networks shall be approved by the Regional Committee for Electrical and Gas Interconnections, and the costs for use and availability of the national networks shall be approved by the national regulating entity that shall not practice discrimination in its use regionally.

ARTICLE 13 – The activity of the regional transmission companies shall be the regional transmission or transport of electrical energy and natural gas, or such other fuel subsequently determined by the Member Countries to be a "Clean Fuel".

ARTICLE 14 – The Regional Market Agents, according to methods approved by Regional Committee of Electrical and Gas Interconnections, shall cover the compensation for availability and use of regional networks.

ARTICLE 15 – Each government shall designate a public entity in their country that shall participate in a publicly or privately funded company, with the aim of developing, designing, financing, constructing and maintaining a first regional transmission system that will interconnect the electrical systems and gas networks of the Parties. None of the Parties shall have direct or indirect control of such an entity. This company, called the "Owner Company of the Network" ("OCN") shall be governed by private law and shall have legal domicile in one of the Parties' countries.

ARTICLE 16 – According to the legal procedures of each country, each government of a Member Country shall grant the respective permission, authorization and concession, depending upon the OCN's responsibilities, in relation to the construction and exploitation of the first regional transmission system and network. This company shall have a lifetime of up to thirty years that may be extended by the Parties.

ARTICLE 17 – According to the legal procedures of each country, each government of a member Country agrees to grant authorization, permits and concessions as necessary for future expansions of OCN's regional transmission networks as well as other regional transmission companies.

REGIONAL ORGANIZATIONS:

ARTICLE 18 - With the intention of obtaining an improved and more effective compliance with the purposes and objectives of this Treaty, and to organize the interrelations among the Regional Market Agents of the Regional Market, the following regional organizations are created: the Regional Committee of Electrical and Gas Interconnections, the Regional Operating Entity (ROE) and the Owner Company Network (OCN).

REGIONAL COMMITTEE FOR ELECTRICAL AND GAS INTERCONNECTION:

Article 19 – The Regional Committee of Electrical and Gas Interconnections is the regulating entity of the Regional Market with its own legal status as well as international public law legal standing applicable to the Parties. It shall be domiciled in one of the Parties' countries as defined by the governments of the Member Countries. Its duration is that of this Treaty.

ARTICLE 20 – The Regional Committee of Electrical and Gas Interconnections shall have sufficient legal standing to act in a judicial as well as extra judicial manner, and to carry out all necessary and advisable acts, contracts, and necessary or advisable operations to comply with its purpose, not only within but also outside of the territory of the signatories of this Treaty, while respecting the principles that satisfy public interest in addition to equality, free competition and publicity.

ARTICLE 21 – In order to comply with its objectives and functions, the Regional Committee of Electrical and Gas Interconnections shall consist of a commissioner from each of the Member Countries named by his respective country for a period of five (5) years extendable. The Regional Committee of Electrical and Gas Interconnections shall rely on whatever technical and administrative organizations that it requires.

ARTICLE 22 – The regional objectives of Regional Committee of Electrical and Gas Interconnections are as follows:

a. To enforce the compliance, protocols, regulations, and other complementary instruments of this Treaty.

b. Endeavor to develop and consolidate the Regional Market, as well as ensure its transparency and proper operation.

c. Promote competition between the Regional Market Regional Market Agents.

ARTICLE 23 – Regional Committee of Electrical and Gas Interconnection's authority is, amongst others, as follows:

a. Regulate the Regional Market functions by issuing the necessary regulations.

b. Take whatever regional and specific measures are necessary with the intention of guaranteeing competitive conditions and non-discrimination in the Regional Market.

c. Adopt decisions that will bring about Regional Market development, assuring its initial functioning and its gradual evolution towards a more competitive situation.

d. Approve the regulations of the physical and economic delivery as proposed by the ROE.

e. Regulate all aspects concerning regional supply and transmission.

f. Resolve authorizations as established by the Treaty according to its regulations.

g. Adopt whatever measures are conducive to avoid abuse on the part of any Regional Market Agent in a position of dominance in the Regional Market.

h. Impose sanctions that are established by protocol with relation to non-compliance with provisions and regulations of the Treaty.

i. Approve rates for the use of the regional transmission system and network according to the corresponding regulations.

j. Resolve conflicts between Regional Market Agents that result from the application of this Treaty.

k. Authorize the companies designated by each Party as Regional Market Agents of the Regional Market.

l. Approve the operational service costs of the system provided by ROE in keeping with the corresponding regulations.

m. Evaluate the Regional Market's evolution periodically, and propose to the Parties whatever measures it deems advisable in order to advance consolidation of the Regional Market.

n. Solicit audited accounting information of the business units as established by Article 5.

o. Coordinate with national regulatory organizations as to necessary measures for proper functioning of the Regional Market.

ARTICLE 24 – Funds required for operating Regional Committee of Electrical and Gas Interconnections shall come from charges on regulations as well as other charges paid by the Regional Market Agents, Government contributions, economic sanctions, interest from commercial transactions, donations and transfers from public or international organizations, funds or resources assigned by law and regulations, in addition to goods or rights acquired by onerous or gratuitous title.

The mechanism to set the cost of regulation and overseeing charges shall be established in the corresponding protocol.

REGIONAL OPERATING ENTITY:

ARTICLE 25 – ROE is the Regional Market's regional operating entity with it's own legal status as well as international public law status, applicable to the Parties. It shall be domiciled in one of the Member Countries as defined by the Parties; it's duration is as defined by this Treaty.

ARTICLE 26 – ROE has the legal status to acquire rights and contract obligations, act in a judicial as well as extra judicial manner, and carry out all necessary and advisable acts, contracts, and operations that comply with its purpose, not only within but also outside of the territory of the signatories of this Treaty, while respecting the principles that satisfy public interest in addition to equality, free competition and publicity.

ARTICLE 27 – In order to comply with it's functions and objectives, the ROE shall be directed by a Board of Directors composed of two Directors from each Party named by their respective Governments, or proposed by the Regional Market Agents of the Regional Market from each country, for a period of five (5) years. Based on protocol or this Treaty, the Parties may provide a different structure for the Board of Directors if they consider it advisable. The ROE shall rely on whatever technical and administrative organizations that it requires.

ARTICLE 28 – The principle objectives and functions of ROE are as follows:

a. Propose Regional Market operating procedures as well as the use of regional transmission networks to Regional Committee of Electrical and Gas Interconnections.

b. Assure that regional energy operations and delivery are performed using economic criteria, endeavoring to achieve adequate levels of security, quality and reliability.

c. Carry out commercial procedures of transactions between Regional Market Regional Market Agents.

d. Support the process of evolution of the Regional Market by supplying information.

e. Devise an expansion plan indicative of regional generation and transmission, foreseeing the establishment of regional reserve margins, and provide it to Regional Market Agents.

ARTICLE 29 - Funds required for running ROE shall come from service charges of the operation of the system as approved by Regional Committee of Electrical and Gas Interconnections, as well as other charges paid by Regional Market Agents, economic sanctions, interest from commercial transactions, donations and transfers from public or international

organizations, funds or resources assigned by law and regulations, as well as goods or rights acquired by onerous or gratuitous title.

AUTHORIZATIONS:

ARTICLE 30 – Public entities from Member Countries dedicated to any activity related to the generation, distribution and marketing of electrical energy are hereby authorized to:

a. Join as Regional Market Agents.

b. Buy and sell energy on a short-term basis following Regional Market rules.

c. Sign long-term energy trade contracts in the Regional Market by means of a bidding process.

ARTICLE 31 - Public entities from Member Countries dedicated to any activity related to the generation, transmission, distribution and marketing of electrical energy and natural gas are hereby authorized to:

a. Purchase on the international market whatever clean fuel is necessary to generate electricity and other fuel supply needs.

b. Subscribe to the purchase of stock from the company or joint venture of companies that constructs the first regional interconnecting lines, and effect these contributions in cash and not in financial instruments, such as land, easement rights, designs, topography and others.

c. Subscribe to contracts in order to guarantee payments for the remuneration of the regional transmission networks.

d. Pay the corresponding charges for normal operations of regional organizations created by this Treaty.

GOVERNMENT COMMITMENTS:

ARTICLE 32 – The governments of the Member Countries:

a. Guarantee free transfer of electrical energy and natural gas through their respective territories for themselves or for third party countries in the region, subject only to the conditions, protocols, and regulations established in this Treaty.

b. Declare a matter of public interest whatever electrical and gas infrastructure works are necessary for the regional electrical and gas market activities.

c. Exempt taxes that discriminate in the Regional Market for import or export traffic transactions of electrical energy and gas between its countries.

RESOLUTION OF CONTROVERSIES:

ARTICLE 33 – Regional Market Agents will endeavor to reach agreement on the interpretation and application of this Treaty, and will strive to find a mutually satisfactory solution for any controversy that might affect proper functioning of the system.

ARTICLE 34 – Controversies that arise among Regional Market Agents who are a part of the Regional Market and cannot be resolved by means of negotiations, shall be sent to Regional Committee of Electrical and Gas Interconnections for final resolution.

ARTICLE 35 - Controversies that arise between governments of Member Countries with respect to the interpretation and application of this Treaty that are not resolved by means of negotiations, upon request of one or another of the disputing Parties, shall be sent for arbitration to a court or to such other organization as agreed to by the Parties for final resolution.

PROTOCOLS:

ARTICLE 36 – In order to facilitate the compliance and proper application of the provisions contained within this Treaty, the Parties will endorse the necessary protocols that will be found within the framework of the final principles and other provisions of this Treaty.

PRIVILEGE AND IMMUNITY:

ARTICLE 37 – Officials of the Regional Committee of Electrical and Gas Interconnections and ROE will be entitled, within the territory of the Member Countries of the Regional Market, to the privileges and immunities that are agreed upon by means of the observance of protocol, without prejudice to that which is established in this Treaty.

VALIDITY, RATIFICATION, ACCESSION, REGISTRATION AND TERMINATION:

ARTICLE 38 – The present Treaty shall be subject to ratification and shall remain subject to accession from other Parties.

A regional office of the South Asia Integration System ("SAIS Office") shall be established and be the repository of instruments referred to in the previous paragraph.

The timeframe of this Treaty shall be indefinite, and it shall be in effect eight (8) days after the date of the filing of the ratification instrument.

For each Party that ratifies this Treaty or accesses to it after having filed or received the second ratification instrument, the Treaty shall go into effect eight (8) days after said Party has filed its ratification or accession instrument.

The SAIS Office, as repository of the Treaty, shall send certified copies to each of the Member Countries whom it will also immediately notify upon filling or receipt of each of the ratification instruments.

The present Treaty may be terminated by any of the Parties by means of a written notification to the SAIS Office, with an advanced notice of ten (10) years after the tenth year in effect.

ARTICLE 39 – In order to revise this Treaty, upon request it can be reviewed by two (2) Member Countries of the Treaty.

EXECUTION:

ARTICLE 40 – The present Treaty has been signed on five (5) equally authenticated copies.

IN WITNESS WHEREOF, the present Treaty is signed in _____ on _____.

By: _____
By: _____
By: _____
By: _____
▪

Appendix C Regional Power Pool Agreements (Exemplary – SAPP)

In addition to an Inter-Governmental MOU (as adapted in section 5.2 of **Annex 5**), the South Africa Power Pool (SAPP) is governed by a hierarchy of additional agreements that serve as examples for implementing regional power trade and pool by SARI/E countries: Inter-Utility MOU, Constitution for a Regional Control Center, Agreement among Operating Members, Operating Guidelines and Short Term Market Agreement and Book of Rules (see adapted versions provided below).

INTER UTILITY MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (MOU) is made and entered into by the signatories. Those signatories that are also Electricity Supply Enterprises are referred to as "Members".

RECITALS

WHEREAS, the national electric power utilities in India, Bangladesh, Nepal and Bhutan ("Members") are engaged in the electricity supply business in their own countries; and

WHEREAS. the Members wish to continue with the development of interconnections between their respective networks and expand capacity and energy trade among themselves; and

WHEREAS, the Members desire to participate in a regional power pool under the name of the South Asia Power Pool (SAPP) to reduce investments and operating costs, enhance reliability of supply and share in the other benefits resulting from the interconnected operation of their systems; and

WHEREAS, the Members wish to provide further opportunities to coordinate the installation and operation of generation and transmission facilities in their respective networks; and

WHEREAS. the Members wish to cooperate and seek mutually beneficial arrangements wherever possible and to refrain from arrangements that would be detrimental to any Member or Members; and

WHEREAS, the Members accept that their relationship be based on the following principles:

(a) That issues related to interconnections be handled in a spirit of cooperation and in a friendly, open and trusting manner;

(b) That Members have equal rights and equal obligations, act in solidarity and refrain from taking advantage of each other.

NOW THEREFORE, the Members agree to enter into this MOU for the formation of the "South Asia Power Pool" hereinafter called the "SAPP" or "Pool".

ARTICLE 1: OBJECTIVES AND PURPOSE

The objective of this Memorandum of Understanding is to facilitate the establishment of the South Asia Power Pool (SAPP) that, in turn, has the objective to provide reliable and economical electric supply to the consumers of each of the Members consistent with reasonable utilization of natural resources and effect on the environment.

The purpose is to establish the basic principles under which the SAPP will operate, inter alia:

(a) the coordination of and the cooperation in the planning and operation of the various systems to minimize costs while maintaining reliability and,

(b) the full recovery of costs and the equitable sharing of the resulting benefits.

Among the benefits that will be achieved, are reductions in required generating capacity, reductions in fuel costs and improved use of hydroelectric energy.

Each Member has the right and obligation, regardless of size or type of organization, to own or otherwise provide the facilities required to provide its electric service requirements.

Each and all of the provisions of this Memorandum of Understanding, are considered necessary to enable the signatories to this Memorandum to accomplish the objectives.

ARTICLE 2: HIERARCHY OF THE DOCUMENTS GOVERNING THE SAPP

The following documents shall govern the establishment and administration of the SAPP. in case of inconsistency. the first document shall have precedence over the second document; the second document over the third document and the third document over the fourth document.

(i) The Inter-Government Memorandum of Understanding.

(ii) The Inter-Utility Memorandum of Understanding.

(iii) The Agreement among Operating Members.

(iv) The Operating Guidelines.

No other document can be construed as governing the establishment and the administration of the SAPP.

ARTICLE 3: DEFINITIONS

In addition to the definitions given below, definitions of terms directly related to the operation of the SAPP are given in the Agreement among Operating Members. Those definitions shall apply if the need arises to obtain the meaning of a term that is defined in the Agreement among Operating Members, but not in this MOU.

ELECTRICITY SUPPLY ENTERPRISE:

An Electricity Supply Enterprise shall mean an entity which operates a Control Center around the clock; which owns - or controls through other means - the operation of several generating units and regularly operates such units to meet a portion or all of its load obligations; which owns a transmission system already interconnected internationally with neighboring Electricity Supply Enterprise(s) or which may be interconnected with such Electricity Supply Enterprise(s) some time in the future (see also Independent Power Producers, Article 3.2).

3.3 INDEPENDENT POWER PRODUCER:

Independent Power Producer shall mean the operator of a generating facility connected to the SAPP grid. Independent Power Producers may participate in the Operating and Planning Subcommittees, but not in the Management or Executive Committees of the SAPP.

3.4 AGREEMENT AMONG OPERATING MEMBERS:

Agreement among Operating Members shall mean an Agreement entered among the Members that have their systems interconnected and which is part of the Operating Subcommittee. Such Members shall be referred to as Operating Members.

3.5 OPERATING MEMBER:

Operating Member shall mean a Member that has its system interconnected internationally with at least one other Member and which is a signatory of the Agreement among Operating Members.

3.6 POWER POOL PLAN:

Power Pool Plan shall mean an overall expansion program of the Members' systems that takes into account possible synergy between these systems. The Power Pool Plan shall be prepared by the Planning Subcommittee in accordance with Article 13.2.2. The Power Pool Plan shall be purely indicative and shall not create an obligation upon the Members to comply.

ARTICLE 4: MANAGEMENT STRUCTURE OF THE SAPP

4.1 SARCC ENERGY MINISTERS AND OFFICIALS

The SARCC Government Ministers and Officials shall be responsible for policy matters which are normally under their control in terms of the national administrative and legislative mechanisms that regulate the relations between the Government and its respective power utility.

The Executive Committee shall refer matters such as requests for membership by non-SARCC countries and major policy issues that may arise to the SARCC Energy Ministries.

4.2

EXECUTIVE COMMITTEE

The Executive Committee shall be composed of the Chief Executives of only those Member Electricity Supply Enterprises who generate, wholesale and retail power to end-use customers. Independent Power Producers shall not be eligible to participate in the Executive Committee. The Committee shall act as the Board of the Power Pool and its duties are described in Article 10. Every Chief Executive shall continue to report to his own Controlling Body and the creation of the SAPP shall in no way alter or modify this relationship. A country having more than one utility meeting these requirements should designate one utility to represent it on the Executive Committee.

4.3 MANAGEMENT COMMITTEE:

The Management Committee shall oversee the administration of the Power Pool and shall ensure that the objectives of the Power Pool, as specified in this MOU, are met. Its duties are described in Article 11.5; in those areas that exceed its authority, the Management Committee shall make recommendations to the Executive Committee. Independent Power Producers shall not be eligible to participate in the Management Committee.

4.4 PLANNING SUBCOMMITTEE:

The Planning Subcommittee shall report to the Management Committee and shall be responsible for planning and other duties described in Article 13.

4.5 OPERATING SUBCOMMITTEE:

The Operating Subcommittee shall report to the Management Committee and shall be responsible for operating and other duties referred to in Article 14.

4.6 ENVIRONMENTAL SUBCOMMITTEE:

The Environmental Subcommittee shall report to the Management Committee and shall be responsible for alerting and advising the Management Committee about environmental and other matters, as described in Article 15.

4.7 COORDINATION CENTER:

The Coordination Center shall report to the Chairperson of the Operating Subcommittee. Its duties are defined in the Agreement among Operating Members.

4.8 TAU:

TAU is the Technical and Administrative Unit of the Energy Sector of SAPP. It shall provide secretarial and other services to the Executive Committee as defined in Article 12.

ARTICLE 5: COMMENCEMENT AND TERMINATION OF THIS MOU

5.1 COMMENCEMENT DATE:

An Electricity Supply Enterprise may become party to this MOU upon signature of the Inter-Government MOU by the relevant Head of State or Minister. Membership of an Electricity Supply Enterprise in the SAPP shall start on the date of signature of this MOU by its Chief Executive. The SAPP shall come into being on the date of the fourth signature of this MOU.

5.2 TERMINATION:

Any Member may terminate its participation in the SAPP by giving three (3) months notice to the Executive Committee, provided the Member is not a signatory of the Agreement among Operating Members. A Member that is a signatory of the Agreement among Operating Members, shall have the right to terminate its participation in the SAPP as specified in the Agreement among Operating Members. Any unfulfilled duties including financial obligations existing as a result of the Power Pool at the date of termination, shall continue in full force until such items have been fulfilled or have expired.

ARTICLE 6: CONDITIONS FOR MEMBERSHIP

6.1 MEMBERSHIP:

All Electricity Supply Enterprises as defined in Article 3.3 situated in a SAPP country as of _____, and any other non-SAPP countries subject to approval of the SAPP Energy Ministers, may become a member of the SAPP. The recommendation from the Executive Committee for the acceptance of an Electricity Supply Enterprise from a non-SAPP country THAT has applied for Membership, must receive a two-thirds majority before it can be forwarded to the SAPP Ministers for approval or rejection.

6.2 OBSERVER STATUS:

By consensus or, failing this, by a two third majority the Executive Committee may grant, upon approval of the SAPP Energy Ministers, Observer status to an Electricity Enterprise interested in the interconnected operation of the Power Pool. Electricity Supply Enterprises having obtained observer status shall all have the same rights and obligations as specified in advance by the Management Committee.

ARTICLE 7: AGREEMENTS WITH NON-MEMBERS

This MOU shall not restrict any Member from having interconnections or agreements with Non-Members provided the following conditions are met:

7.1 such agreement(s) shall not create obligations upon a Member that is not party to such agreement(s).

7.2 such agreement(s) shall not impair a Member from fulfilling its obligations under the SAPP Agreement.

7.3 unless all the affected Members have agreed beforehand, Members shall trade in electricity only with the Non-Member systems to which they are directly connected.

ARTICLE. 8: PREVIOUS AGREEMENTS

8. 1 The execution of this MOU shall not impair, amend or change any previous contract or agreement, and such contracts or agreements shall continue, including all rates, terms and conditions, until the expiration of such contracts or agreements or termination of such contracts or agreements in accordance with the provisions contained in such contracts or agreements.

8.2 If this MOU requires Members to fulfill duties that are already specified in existing agreements, nothing additional needs to be done by the Members in those specific areas.

8.3 If this MOU requires Members to fulfill duties that are only in part specified in existing agreements, only the portion of the requirements that is in excess of what is already specified in existing agreements needs be added to what must already be done by the Members.

ARTICLE 9: INTERCONNECTED TRANSMISSION FACILITIES

9.1 OWNERSHIP:

Unless otherwise agreed, each Power Pool Member, whether an Operating Member or not, shall at its own costs, build, operate and maintain its own transmission facilities.

9.2 OPERATION:

To the extent that the Management Committee is satisfied that no use of transmission facilities will cause overload, abnormal losses, endanger the stability of the interconnected system or cause undue hardship to another Member, nothing in this MOU shall restrict a Member In the use of its own transmission facilities.

ARTICLE 10: EXECUTIVE COMMITTEE

10.1 REPRESENTATION:

The fourth signature of this MOU shall automatically create an Executive Committee consisting of the Chief Executives of eligible Members as defined in Article 4.2. It shall act as the Board of the Pool and shall be the authority governing the administration and formulating the objectives of the SAPP.

10.2 MEETINGS:

The Executive Committee shall meet at least once a year and the Chairperson shall be from the Member hosting the meeting. The Chairmanship and the venue of the meeting shall rotate annually and meetings at other times shall be at the call of the Chair or at the request of a Member(s).

10.3 MINUTES:

A summary of the main revisions shall be prepared at the end of each meeting and signed by the Member's representatives. The minutes of the meetings shall be prepared by TAU and shall include, but shall not be limited to: a summary of all decisions made; actions taken; tasks to be carried out and all future deadlines. Copies of such minutes shall be mailed within twenty-one (21) days after each meeting to each Member of the Committee. Failure to object in writing to the minutes within thirty (30) days after mailing shall be deemed to constitute approval thereof. The minutes of all meetings shall be kept by TAU and shall be made available to the SAPP Energy Ministers for information and to all Members.

10.4 CHAIRPERSON:

The Committee shall elect a Chairperson who shall hold office for a period of at least one year, but not more than three (3) years. The Chairmanship shall rotate among the Members who are signatories of the Agreement among Operating Members.

10.5 MANAGEMENT COMMITTE AND SUBCOMMITTEES:

The Executive Committee shall specify and amend from time to time the duties and authority, other than set forth herein, of the Management Committee, the Environmental Subcommittee, the Planning Subcommittee the Operating Subcommittee and any Working Group or Task Force which may be established by the Executive Committee.

10.6 OTHER MATTERS:

The Executive Committee shall decide within sixty (60) days on any matter referred to it by a Member(s) or by the Management Committee, including the exclusion of a Member(s).

10.7 ACCEPTANCE OF NEW MEMBERS:

The Executive Committee shall, upon the approval of the SAPP Energy Ministers, accept new Members into the SAPP as specified in Article 6.1.

10.8 GRANTING OF OBSERVER STATUS:

The Executive Committee shall have the authority, upon approval of the SAPP Energy Ministers, to grant observer status to Electricity Supply Enterprises that may apply as defined Article 6.2. The granting of Observer status shall allow the Electricity Supply Enterprise to attend meetings and participate, but it shall have no voting rights in any of the committees or Subcommittees.

10.9 COMMITTEE EXPENSES:
Each Member represented at the Executive Committee shall arrange and finance the participation of its own representative{s) in the various committees, task forces and Subcommittees. TAU shall arrange and finance the participation of its own representative(s).

10.10 DECISION PROCDURES:

10.10.1 Each Member shall have one vote at the Executive Committee.

10.10.2 Decisions will be made by consensus or, failing this, by a two thirds majority of the Members present at the meeting, unless otherwise stated in this MOU.

10.10.3 The presence at the meeting of two thirds of the Members shall constitute a quorum.

10.10.4 Only Members that are signatories of the Agreement among Operating Members shall vote on Service Schedules and on operational issues.

10.10.5 The decisions made by the Committee shall be binding on all Members, including those that did not attend the meeting.

10.10.6 In case of a dispute between Operating Members, the matter shall be referred to Arbitration in accordance with the Agreement among Operating Members, unless another procedure is agreed to by the Members.

ARTICLE 11: THE MANAGEMENT COMMITTEE

11.1 REPRESENTATION:

The Management Committee shall consist of a maximum of three representatives per Member and these representatives shall be of sufficient seniority in their own organization to make all relevant decisions. A Member's main representative(s) at the Planning and at the Operating Subcommittees shall also be its representatives at the Management Committee.

11.2 MEETINGS:

The Committee shall meet at least once a year. The Chairperson of the forthcoming meeting shall send notice of the meeting at least one month prior to the meeting. A final detailed Agenda shall be sent to all Members at least three weeks in advance. The date and venue of the following meeting shall be decided by the Members at each meeting.

11.3 MINUTES:

A summary of the main decisions shall be prepared at the end of each meeting and signed by the Members' representatives. Minutes shall be prepared by the Chairperson and shall include, but shall not be limited to: a summary of all decisions made; actions taken; tasks to be carried out and all future deadlines. Copies of such minutes shall be mailed within twenty-one (21) days after each meeting to each Member of the Committee. Failure to object in writing to the minutes within thirty (30) days after mailing shall be deemed to constitute approval thereof. Minutes of all meetings shall be sent to the Coordination Center.

11.4 DECISION PROCEDURES:

11.4.1 Each Member shall have one vote at the Management Committee.

11.4.2 Decisions will be made by consensus or, failing this, by a two-thirds majority of the Members present at the meeting, unless otherwise stated in this MOU.

11.4.3 The presence at the meeting of two thirds of the Members shall constitute a quorum.

11.4.4 Only Members that are signatories of the Agreement among Operating Members shall vote recommendations pertaining to Service Schedules and on operational and planning issues affecting interconnected operations.

11.4.5 The decisions made by the Committee, shall be binding on all Members, including those that did not attend the meeting.

11.4.6 In case of a dispute between Members that cannot be resolved by this Committee, the matter shall be referred to the Executive Committee or Arbitration in accordance with the Agreement among Operating Members.

11.5 DUTIES OF THE MANAGEMENT COMMITTEE:

The duties of the Management Committee shall include, but shall not be limited to the following:

11.5.1 Oversee the work and approve the recommendations of the Subcommittees.

11.5.2 Make all decisions on those matters not specifically delegated to other Committees.

11.5.3 Organize the training of the staff that will handle Power Pool interactions.

11.5.4 Direct the Operating, Planning and Environmental Subcommittees to establish, working groups or task forces as required.

The following duties shall be carried out only by the Operating Members:

11.5.5 In accordance with the directives of the Operating Members of the Executive Committee, establish a Coordination Center that will provide day-to-day information and administrative services to the Operating Members in order to assist them in the implementation of the Agreement among Operating Members.

11.5.6 Establish and oversee the implementation of common accounting procedures for transactions, capacity deficits and energy deficits to determine the inter-utility payments resulting from the Agreement among Operating Members.

11.5.7 Establish the methods, procedures and intervals of reporting scheduled and actual capacity and energy interchanges.

11.5.8 Establish methods and procedures for accounting and billing for capacity and energy interchanges.

11.5.9 Ensure the collection and analysis of the data relevant to the operation and planning of the interconnected system,

11.5.10 Ensure that suitable computer hardware and software and sufficient communication facilities are available to the Members and to the Coordination Center to perform their duties.

11.5.11 Recommend to the Executive Committee the introduction of new Service Schedules, the removal of unnecessary Service Schedules and the revision as necessary, of existing Service Schedules.

11.6 CHAIRPERSON

The Committee shall elect a Chairperson who shall hold office for a period of at least one year, but not more than two (2) years. The Chairmanship shall rotate among the Members who are signatories of the Agreement among Operating Members.

11.7 DUTIES OF THE CHAIRPERSON:

11.7.1 The Chairperson shall provide an Agenda and preside over the Committee meetings.

11.7.2 The Chairperson shall bear overall responsibility for the Committee's activities and shall act as its spokesman.

11.7.3 The Chairperson shall decide whether the entire meeting or any part of it should be limited to those having Member status.

11.7.4 The Chairperson shall nominate a representative to serve as an observer at any relevant Committee meeting.

11.7.5 The Chairperson shall notify, in writing, all appointed Chairpersons and representatives to existing or new committees, working groups, or task forces created by the Management Committee.

11.7.6 The Chairperson shall invite participation of other utilities, organizations or experts as required.

11.7.7 The Chairperson shall maintain records of the proceedings of the Management Committee. After the establishment of the Coordination Center, these records shall be retained at the Coordination Center to be available to all Members on request.

ARTICLE 12: DUTIES OF THE TECHNICAL AND ADMINSITRATIVE UNIT

The duties of TAU with respect to the SAPP shall consist of the following:

(i) To provide a secretariat to the Executive Committee.

(ii) To advise the Executive Committee of the relevant rules and regulations of SAPP.

(iii) To assist the Executive Committee in achieving SAPP objectives with regard to the establishment and development of the SAPP .

(iv) To report to the SAPP Committee of Energy Ministers.

(v) To seek and mobilize funds as recommended by the SAPP Executive Committee.

ARTICLE 13: PLANNING SUBCOMMITTEE

13.1 REPRESENTATION:

The Planning Subcommittee shall consist of a maximum of two representatives per Member and these representatives shall be of sufficient seniority in their own organization to make all relevant decisions.

13.2 DUTIES OF THE PLANNING SUBCOMMITTEE:

The duties of the Planning Subcommittee shall include, but shall not be limited to the following:

13.2.1 Establish and update common planning and reliability standards that have an impact on the SAPP.

13.2.2 Based on individual Member's plans, develop every two years, an overall Power Pool Plan to highlight the benefits and opportunities for cost savings that can be derived by the Members from the Coordination of activities. The Power Pool Plans shall:

(i) Take into account the forecasted demand and energy consumption in each Member's system, including Demand Side Management.

(ii) Indicate the anticipated sales and purchases by each Member, including those with Electricity Supply Enterprises or Independent Power Producers Non-Member of the SAPP .

(iii) Contain the characteristics, location and commissioning dates of the new generating units and new transmission facilities of ___ KV and above which are planned in each Member's system, when such facilities have a significant impact on the interconnected system.

(iv) Contain the characteristics, location and commissioning dates of the new telecommunication, telecontrol and supervisory facilities that are planned in each Member's system, when such facilities have a significant impact on the operation of the interconnected system.

(v) Identify and record new generation, transmission, telecommunication or telecontrol facilities to be installed in the systems of Members and Non-Members.

13.2.3 Evaluate software and other tools which will enhance the value of planning activities such as load forecasting, the determination of planning or reliability standards, cost-benefit analysis or system studies; submit proposals to the Management Committee.

The following duties shall be carried out only by the Operating Members:

13.2.4 Submit proposals to the Operating Members of the Management Committee regarding new Service Schedules, removal of unnecessary Service Schedules and revision as necessary of existing Service Schedules.

13.2.5 Specify the reliability standards that shall be used to determine the Accredited Capacity Obligation of each Operating Member.

13.2.6 Present a course of action that will enable each Operating Member to comply with its Accredited Capacity Obligation.

13.2.7 Establish the benefits attributable to each Operating Member resulting from the installation of relays, control equipment or any system study, improvement or facility required for the satisfactory operation of the interconnected system and make recommendations to the Operating Members of the Management Committee regarding the financial contribution of each Operating Member to the costs of such improvements.

13.2.8 Establish future transfer capability limits between systems to enable the Operating Subcommittee to prepare detailed Operating Procedures.

13.2.9 Identify specific reliability problems and recommend the generation or transmission additions or changes required to eliminate them.

13.2. 10 Establish capacities of transmission plant in the system of Operating Members for the purposes of calculating wheeling rates and review these on an annual basis.

13.3 CHAIRPERSON

The Planning Subcommittee shall elect a Chairperson to serve for at least one (1) year term, but not more than two (2) years, after which the Chair shall rotate to other Members. The Chairperson shall be elected from the Operating Members of the SAPP .

13.4 ADMINISTRATIVE MATTERS:

The rules governing the meetings, minutes, decision procedures, duties, election and tenure of the Chairperson of the Planning Subcommittee, shall be the same as for the Management Committee.

In case of disagreement between Members, the matter shall be submitted to the Management Committee. The report shall reflect the majority view and include a statement by the minority.

ARTICLE 14: OPERATING SUBCOMMITTEE

14.1 REPRESENTATION:

The Operating Subcommittee shall consist of representatives of Members that are signatories of the Agreement among Operating Members. It shall have a maximum of two representatives per Member and these representatives shall be of sufficient seniority in their own organization to make all relevant decisions. The main representative shall also be a participant in the Management Committee.

14.2 DUTIES OF THE OPERATING SUBCOMMITTEE:

The duties of the Operating Subcommittee shall be in accordance with the Agreement among Operating Members.

14.3 CHAIRPERSON:

The Operating Subcommittee shall elect a Chairperson to serve for at least one (1) year term, but not more than two (2) years, after which the Chair shall rotate to other Members.

14.4 ADMINISTRATIVE MATTERS:

The rules governing the meetings, minutes, decision procedures, duties, election and tenure of the Chairperson of the Operating Subcommittee, shall be the same as for the Management Committee.

In case of disagreement between Members, the matter shall be submitted to the Management Committee. The report shall reflect the majority view and include a statement by the minority.

ARTICLE 15: ENVIRONMENTAL SUBCOMMITTEE

15.1 REPRESENTATION:

Each Member shall appoint one representative to the Environmental Subcommittee.

15.2 MEETINGS:

The Environmental Subcommittee shall hold an annual meeting in the first quarter of each calendar year and shall hold other meetings at the call of the Chairperson or at the request of any Member. At least one (1) month written notice shall be given of any meeting and shall state the time and place of the meeting and include an agenda of the items to be considered.

15.3 CHAIRPERSON:

The Environmental Subcommittee, at its annual meeting, shall elect a Chairperson to serve for at least a one (1) year term, but not more than two (2) years, after which the Chair shall rotate to the other Members.

15.4 DUTIES:

Under the direction of the Management Committee, the Environmental Subcommittee shall keep abreast of world and regional matters relating to air quality, water quality, land use and other environmental issues. Where Governments have in place related Environmental Organizations, this Committee shall liaison with them to assist one another on specific issues. The Subcommittee shall present all findings and recommendations to the Management Committee, the Planning and Operating Subcommittees and shall also carry out other functions and activities as assigned or approved by the Management Committee.

ARTICLE 16: COORDINATION CENTER

16.1 CREATION OF THE COORDINATION CENTER:

The representatives of the Operating Members at the Management Committee shall propose the creation of a Coordination Center to the representatives of the Operating Members at the Executive Committee. The functions and duties of the Coordination Center, when it is established, shall be in accordance with the Agreement among Operating Members.

16.2 CONTRIBUTIONS TO COSTS BY NON-OPERATING MEMBERS

Since Members that are not signatories of the Agreement among Operating Members will nevertheless benefit from the Coordination Center by obtaining information and other services from it, they shall contribute to the costs of the Coordination Center in accordance with the rulings of the Management Committee. Non-Members may also receive information from the Coordination Center, but shall pay market rates for such information.

ARTICLE 17: AMENDMENTS

This MOU may be reviewed from time to time, but no modification shall be of any force or effect unless reduced to writing and approved by the Executive Committee.

ARTICLE 18: ASSIGNMENT

Each Member shall have the right to assign this MOU to any successor to all or substantially all of its electric properties, whether by merger, consolidation, sale or otherwise, without the consent of the other Members, provided such successor shall agree in writing to assume the obligations of such Member. This provision shall be applicable to assignees in succession.

ARTICLE 19: NOTICES AND DOMICILIUM

19.1 COMMUNICATION:

Any communication or documents given or sent by any Member or TAU to any other Member or TAU shall be in writing and shall be deemed to have been duly delivered to the party to which it is addressed at its respective address, namely:

(insert)

19.2 DELIVERY TIME:

19.2.1 If a communication is delivered by hand, it shall be deemed to have been received by the addressee on the date of delivery.

19.2.2 If posted by pre-paid registered post, it shall be deemed to have been received by the addressee on the fourteenth (14) day after postage.

19.2.3 If sent by telex, telegram or facsimile, it shall be deemed to have been received by the addressee one (1) day after dispatch.

19.3 CHANGE OF ADDRESS:

Any Member may, by written notice to all of the other Members, change the address to which any notice or request intended for the Member giving such notice, shall be addressed.

IN WITNESS whereof the said Operating Members have hereto set their hands:

SOUTH ASIA REGIONAL POWER POOL

CONSTITUTION OF THE COORDINATION CENTER

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SOUTH ASIA REGIONAL POWER POOL
CONSTITUTION OF THE COORDINATION CENTER

ARTICLE 1: PREAMBLE/RECITALS

WHEREAS, under the terms of the Memorandum of Understanding ("MOU") dated _____ that established a plan to interconnect the grids of India, Nepal, Bhutan and Bangladesh, the management structure of the regional power pool ("SAPP") provides for a Coordination Center reporting directly to the Operating Sub-Committee of the Management Committee; and

WHEREAS, under the MOU, Operating Members of the Management Committee are empowered to establish a Coordination Center which will provide day-to-day information and administrative services to the Operating Members in order to assist them in the implementation of the South Asia Power Pool Agreement among Operating Members dated _____; and

WHEREAS in pursuance of a directive given by Operating Members of the Executive Committee established by the MOU on _____ who resolved to establish a Coordination Center to be based in _____;

NOW THEREFORE THE OPERATING MEMBERS OF THE SAPP DO HEREBY AGREE TO ENDORSE AND BIND THEMSELVES TO THIS, THE CONSTITUTION OF THE COORDINATION CENTER.

ARTICLE 2 INTERPRETATION OF TERMS

In this Constitution:

2.1 "ABOM" means the Agreement among Operating Members;

2.2 "Coordination Center" means the Coordination Center of the SAPP as defined in the ABOM;

2.3 "Executive Committee" means the Executive Committee of the SAPP as defined in the MOU;

2.4 "Financial Year" means the financial year of the Coordination Center which shall be a period of 12 (TWELVE) calendar months reckoned for the 1st of April in one calendar year and ending on the 31 s: of March in the following calendar year;

2.5 "Management Committee" means the Management Committee of the SAPP referred to in the MOU;

2.6 "Manager" means the Manager of the Coordination Center;

2.7 "Operating Member" means an Operating Member of the SAPP;

2.8 "Operating Sub-Committee" means the Operating Sub-Committee of the Management Committee referred to in the MOU; and

2.9 "SAPP" means the South Asia Power Pool established in terms of the MOU.

ARTICLE 3: ESTABLISHMENT OF THE COORDINATION CENTER AND ITS HEAD OFFICE

There is hereby established that a Coordination Center of the SAPP to be located in _____ at a place to be agreed upon by Operating Members, which place shall serve as the Head Office of the Coordination Center.

ARTICLE 4: LEGAL STATUS OF THE COORDINATION CENTER

4.1 The Coordination Center shall be a common law body corporate capable of suing and being sued, acquiring rights and incurring obligations and generally exercising all the rights and privileges accorded to and ordinarily enjoyed by a legal entity, subject however to the provisions of this Constitution as read with the MOU and ABOM;

4.2 The Coordination center shall exist and be managed and operated solely for the common benefit of the Members and not for profit.

ARTICLE 5: MISSION STATEMENT AND OBJECTIVES OF THE COORDINATION CENTER

5.1 The Coordination Center is an organization dedicated to the effective implementation of SAPP objectives.

5.2 In order to obtain the mission, the following objects are set:

(i) to create and maintain an effective organization and infrastructure;
(ii) to promote the interest and image of the Coordination Center in any manner;
(iii) to provide and disseminate specified, applicable and current information on developments and trends in SAPP, transactions between Member and in the worldwide electricity supply industry;
(iv) to regulate, foster and maintain fair and just relationships between Members and to encourage and maintain training requirements of SAPP;
(v) to encourage research and development of new plant and methods for use in the South Asia electricity supply industry;
(vi) to advise Members on matters of common interest and concern;
(vii) to advise Members on matters affecting the relationship between themselves; and

ARTICLE 6: MEMBERSHIP

6.1 General: Membership shall be obtained by being accepted as a member of SAPP as prescribed in the MOU and being represented on the Management Committee; and paying the prescribed contributions as stipulated in the MOU read with the ABOM.

6.2 Operating Members: Operating Members will be those Members of SAPP that have signed and acceded to the ABOM. Operating Members shall be entitled to vote on all Coordination Center matters.

6.3 Non-Operating Members: Non-Operating Members will be those Members of SAPP who have signed the MOU but not the ABOM. Non-Operating Members shall be entitled to vote on all Coordination Center matters that they may vote on as members of the SAPP Management Committee.

6.4 Termination of Membership: A Member's membership shall terminate in the following circumstances: (i) if he resigns his membership by notice in writing in terms of the MOU; (ii) if any monies due and payable to the Coordination Center remain unpaid after the expiry of the prescribed time or such extended time as may be allowed by the Management Board; (iii) if a body corporate Member is de-registered and not reconstituted as another legal entity to whom its rights and obligations are assigned; (iv) if a provisional or final judicial manager, sequestration or liquidation order is granted against any Member; (v) if his membership of SAPP is terminated for any reason.

6.5 Membership Fees

6.5.1 Operating Members shall pay the contributions as determined in the ABOM. Non-Operating Members shall pay the contributions as may be determined from time to time by the Management Committee of SAPP at a General or Special General Meeting of the Coordination Center;

6.5.2 Members may be required to make additional contributions in circumstances where the Coordination Center experiences a shortage of funds as determined at a General or Special General Meeting of the Coordination Center;

6.5.3 All membership fees are due and payable on the first day of the Financial Year, failing which the provisions of the ABOM where applicable will apply; The liability of a Member is limited to the amount of its unpaid membership fees or any other amount to which the Member is indebted to the Coordination Center.

6.5.4 Failure to pay membership fees renders the Member's membership liable to be suspended or terminated by the Management Board if a Member regularly fails to pay membership fees when due; failure to pay fees disqualifies the Member from voting at any General Meeting of the Coordination Center whilst such membership fees remain unpaid.

ARTICLE7: INCOME OF THE COORDINATION CENTER

7.1 The income of the Coordination Center shall solely comprise of the contributions made by Operating and Non-Operating Members towards the operating and running costs of the Coordination Center under terms of Article 81 and 8.2 of this Constitution and any donation or grant made by any Government, organization or person.

7.2 The income of the Coordination Center, and any accrued interest accruing, shall be used solely in funding the operations of the Coordination Center and not be paid to or ensure to the benefit of any individual Member, except payment for approved services rendered to the Coordination Center by such Member.

ARTICLE 8: FINANCIAL AFFAIRS AND CONTROL

8.1 The operations of the Coordination Center, including remuneration of the staff thereof, shall be funded by Members in the manner and proportions stipulated in the ABOM.

8.2 The Manager shall be the accounting officer of the Coordination Center responsible for administering the financial affairs thereof in compliance with the provisions of the ABOM regarding, among other things, preparation of the Coordination Center's budget, keeping of

income and expenditure records and the preparation and issuing of financial statements for each Financial Year.

8.3 The Coordination Center shall keep such books of accounts and employ such bookkeeping system as shall be approved by the Management Committee acting on the recommendations of the Operating Sub-Committee.

8.4 The Coordination Center shall open and operate a current bank account with such internationally recognized and registered commercial bank in _____ as shall be approved by the Management Committee acting on the recommendations of the Operating Sub-Committee.

All contributions made by Members and Non-Members towards funding the Coordination Center shall be deposited in the bank account wherefrom shall be withdrawn all moneys required for meeting the authorized expenditure of the Coordination Center.

8.5 The financial statements of the Coordination Center shall be audited annually and within 3 (THREE) months of the close of the Financial Year by a reputable and registered firm of chartered accountants appointed by the Management Committee acting on the recommendations of the Operating Sub-Committee. The audited financial statements shall be presented to the Management Committee within 6 (SIX) months of the close of the Financial Year for presentation to and consideration by the Executive Committee at its next annual meeting.

8.6 No Member or other person shall borrow money from the Coordination Center.

ARTICLE 9: POWERS, FUNCTIONS AND DUTIES

9.1 For purposes of achieving its purpose the Coordination Center shall have the power to:

(i) acquire, either by purchase, lease or otherwise, any movable or immovable property or also to sell, mortgage or otherwise deal with or dispose of movable or immovable property or other assets belonging to the Coordination Center;

(ii) institute or defend any legal action on behalf of or against the Coordination Center;

(iii) operate as an independent entity servicing SAPP;

(iv) meet the financial requirements of the Coordination Center by means of membership fees, loans, bank overdrafts, donations or grants and it shall not accept any donation that is not irrevocable and unconditional;

(v) utilize its fund solely for the object for which the Coordination Center has been established and shall not distribute any of its funds or assets to any person except as payment for goods or services;

i) utilize the capital and income of the Coordination Center in order to achieve the aims and objectives set t in this Constitution, provided the activities of the Coordination Center shall be wholly or mainly directed to e furtherance of its mission and objectives;

ii) for purposes of promoting and achieving the objects and aims of the Coordination Center, receive or quire immovable property and to sell and dispose of or, to rent or lease such property provided that the oordination Center:

a. shall not become engaged in trading or speculative transactions;
b. operate and use banking accounts and arrange for overdraft facilities to attain the objectives of the Coordination Center;

c. administer, insure, sell, rent, bond, dispose of, pool, develop, improve or beneficially occupy all or any of the assets of the Coordination Center;
d. secure the payment of any obligations of the Coordination Center in any way whatsoever, including the hypothecation thereof, the pledging thereof, in any or by way of cession or transfer of property or rights;
e. invest money not immediately required in any manner, to liquidate investments and to re-invest same;
f. make, issue, draw, accept, endorse or discount any promissory note or any form of negotiable instrument;
g. appoint a Manager and other employees, advisors, consultants, agents and contractors and to remunerate them and terminate their services;
h. indemnify officials and employees with regard to any damages, injuries or liabilities incurred by them in the bona fide exercise of their duties or employment;
i. take out any form of insurance with regard to its powers, functions and duties;
j. do all that may be necessary or convenient to give effect to the mission and objectives and to exercise the powers of the Coordination Center

9.2 The functions and duties of the Coordination Center shall be those specified in the ABOM, including:

(i) monitor continuously the operation of the Regional Power Pool;
(ii) monitor transactions between Operating Members and between Members and Non-Members;
(iii) monitor time correction procedures;
(iv) monitor the inadvertent power flows and the returns in kind between the Members;
(v) provide routine daily reports, data and information relevant to the operation of the Power Pool to the Operating Sub-Committee and to the Members;
(vi) monitor and advise on the use of the Operating Guidelines;
(vii) monitor and report on the control performance criteria, as specified in the Operating Guidelines, to all the Operating Members;
(viii) convene, following a disturbance affecting the parallel operation of the Pool, a post disturbance committee;
(ix) provide information and give technical advice to Members in matters pertaining to parallel operation;
(x) evaluate the impact of future projects on the operation of the Pool and advise the Operating Sub-Committee accordingly;
(xi) perform various operational planning studies to highlight possible operating problems;
(xii) give advice on short-term and long-term operating problems;
(xiii) perform studies to determine transfer limits on tie lines and inform Operating Members accordingly. Monitor adherence of Operating Members to these limits;
(xiv) establish and update a data base containing historical and other data to be used in Planning and System Operation studies;
(xv) monitor the availability of the communication links between the Control Centers of the Operating Members and between those Control Centers and the Coordination Center;
(xvi) advise on the feasibility of wheeling transactions;

(xvii) gather and act as the official custodian of data pertaining to transactions between Operating Members and between Operating Members and Non Members;
(xviii) monitor the protection performance of all tie lines;
(xix) carry out projects and assignments as directed by the Operating Sub Committee;
(xx) monitor the protection performance of all tie lines;
(xxi) monitor the Coordination Center-ordination of protection on all tie lines;
(xxii) monitor adherence to the Agreement by the Operating Members, inter alia regarding Accredited Capacity Obligation and calculate the penalties for insufficient Accredited Capacity and their re-allocation among Members;
(xxiii) disseminate the generation and transmission maintenance schedule received from the Operating Members and advise on the adjustments that are required to maintain at all times the contractual Pool reserves and the agreed upon services;
(xxiv) co-ordinate the training of the Members' staff and if necessary, organize training seminars focusing on the operation of the interconnected system;
(xxv) prepare and issue annually a control performance summary report for the benefit of the Operating Sub-Committee;
(xxvi) identify capital projects required by the Coordination Center and make proposals to the Operating Sub-Committee;
(xxvii) endeavor to obtain funding for the capital projects of the Coordination Center upon approval by the Operating Sub-Committee;
(xxviii) prepare and present an annual budget covering the Coordination Center expenditure for approval by the Operating Subcommittee;
(xxix) produce a monthly financial statement as specified by the Operating Sub-Committee;
(xxx) and such other functions and duties as may be lawfully assigned from time to time.

ARTICLE 10: ADMINISTRATIVE AFFAIRS

10 1 Management of the Coordination Center shall vest in a Manager appointed as provided in the ABOM who shall be answerable and accountable to the Operating Sub-Committee on the operations and performance of the Coordination Center and other related maters.

10.2 The Manager shall be entitled and empowered to recruit such personnel to man the Coordination Center on such terms and conditions as shall be approved by the Management Committee acting on the recommendation of the Operating Sub-Committee.

10.3 The Manager shall at all times keep confidential and ensure confidentiality of all information supplied by or to the Coordination Center by Members or vice versa.

10.4 The Management Committee shall, in terms of Article 1.5.10 of the MOU, ensure that suitable computer hardware and software, sufficient communication facilities and other requisite resources are made available to the Coordination Center for use in the performance of its functions and duties.

10.5 No Member shall interfere with or otherwise hinder or obstruct the management and staff of the Coordination Center in the performance their functions and duties.

ARTICLE 11: MANAGEMENT BOARD

11.1 The Operating Sub-Committee of SAPP established in terms of the MOU shall act, if specifically so convened, as the Management Board of the Coordination Center.

11.2 The chairman for the time being of the Operating Sub-Committee shall chair the meetings.

11.3 The Coordination Center shall provide secretarial services to the Management Board.

11.4 The Manager of the Coordination Center shall attend all meetings of the Management Board but have no vote.

11.5 The Management Board shall meet as often as it is deemed necessary but not less than four times during a financial year.

11.6 The Coordination Center shall keep minutes of all resolutions take, which shall be held in safekeeping and made available to Members.

11.7 Meetings shall be convened by giving not less than 10 (TEN) days written notice, provided that the chairman may call a meeting on shorter notice. The notice convening a meeting shall be accompanied by an agenda to such meeting,

11.8 The Management Board shall have the power to appoint sub-committee from amongst itself or others as it deems fit and delegate to such committees all powers and duties vested in itself.

11.9 A quorum shall be 75% of the Operating Members, which must be maintained throughout the sitting. Should a quorum not be present, the chairman shall adjourn the meeting to a place and time not less than 1 (ONE) week and not more than 1 (ONE) month thereafter. The Operating Members present at such adjourned meeting shall constitute a quorum.

11.10 Any resolution of the Management Board in writing (whether contained in one or more documents), duly signed by Management Board members constituting a quorum in terms of this Constitution, shall be valid as if the resolution had been taken at a duly constituted meeting of the Management Board, notwithstanding any other provision to the contrary contained in this Constitution.

11.11 Resolutions of the Management Board shall be binding on all Members.

ARTICLE 12: POWERS OF MANAGEMENT BOARD

12.1 In addition to any other powers conferred on the Management Board, it shall have the power to:

(i) Manage and control the affairs of the Coordination Center and do whatever it considers appropriate to achieve the mission and the objects of the Coordination Center.
(ii) Appoint accountants, auditors, lawyers, engineers, consultants and any other professional firm or person on such terms as it decides upon.

(iii) Receive funds and open and administer bank accounts on behalf of the Coordination Center;
(iv) Take the necessary measures to protect the property and rights of the Coordination Center.
(v) Execute the policy of the Coordination Center as determined by the General Meeting.
(vi) Purchase, borrow, acquire, sell, lease, mortgage or otherwise deal with, dispose of any movable or immovable property of the Coordination Center.
(vii) Enter into any agreement for and on behalf of the Coordination Center and to authorize the signing of all documentation to give effect thereto in the name of the Coordination Center.
(viii) Institute, conduct, defend, compound or abandon any legal proceeding by or against the Coordination Center.
(ix) Cooperate with any person, body, organization or association or to make agreements that promote the aims and objectives of the Coordination Center.
(x) Administer membership according to the Constitution and regulations.
(xi) Deal with any matter not specifically provided for in this Constitution in the best possible way.

ARTICLE 13: GENERAL MEETING

13.1 General

13.1.1 The Management Committee of SAPP, when specifically so convenes shall be a General Meeting or Special General Meeting of the Coordination Center.
13.1.2 The Coordination Center shall hold an Annual General Meeting within 6 (SIX) months after the end of each Financial Year.
13.1.3 The Coordination Center may hold a Special General Meeting as the Management Board may decide from time to time.
13.1.4 The Manager of the Coordination Center shall attend all General and Special General Meetings of the Coordination Center.
13.1.5 A Special General Meeting shall also be convened upon the written request of at least one third of all Members and upon at least 7 (SEVEN) days' written notice to all Members accompanied by proper notification of the purpose of such meeting.
13.1.6 All General Meetings shall be open to all Members to attend.
13.1.7 Notice of General Meetings, setting the time and the place of the meeting shall be given to all Members not later than 21 (TWENTY ONE) days before the General Meeting. The notice shall be accompanied by an agenda, which shall contain in full the motions to be considered by the General Meeting and a proxy form.
13.1.8 The Chairman of the SAPP Management Committee shall chair the General Meeting. In his absence the meeting shall appoint a chairman.
13.1.9 The proceedings at the General Meeting shall not be invalidated on the grounds that a notice has not been received by a Member, who attending the meeting.
13.1.10 The Coordination Center shall provide the secretarial services require for any General or Special General Meeting of the Coordination Center and shall keep minutes of all resolutions taken which shall be held in safe keeping and made available to Members on request.

13.2 Quorum

A quorum for meetings shall be at least 50 (FIFTY) per cent of all fully paid-up Members which must be maintained throughout. Should a quorum not be present, the Chairperson shall adjourn the meeting to a place and time not less than 1 (ONE) week and not more than 1 (ONE) month thereafter. The Members at such adjourned meeting shall constitute a quorum.

13.3Voting

13.3.1 All matters before the General Meeting shall be decided by a majority vote.

13.3.2 Each member entitled to vote in terms of Article 8 shall have one vote. Only Members in good standing shall be entitled to vote.

13.3.3 Members may vote either in person or by proxy. A proxy form shall be attached to the notice of the General Meeting and all proxy forms appointing a proxy shall be returned to the Secretary and Communications Committee at least 7 (SEVEN) days prior to the date of the General Meeting.

13.3.4 Voting shall be executed by a show of hands.

13.3.5 If there is a deadlock during the vote on any resolution the following rules shall apply: (i) a second vote by ballot shall be called for by the Chairman before the close of business of the meeting; (ii) if after the second vote the vote is still deadlocked the meeting in respect of any deadlocked votes shall be adjourned to a date not later than 3 (THREE) weeks after the date of the present meeting at which meeting the only business to be conducted will be reconsideration of the deadlocked resolution, except if the Members unanimously agree to additional agenda items; (iii) if at the adjourned meeting the note remains deadlocked the deadlocked resolution will be referred by the Coordination Center Manager to the Executive Committee of SAPP for mediation between the Members in deadlock The Coordination Center Manager will prepare a summary of the proceedings to date and forward it to the Chairman of the Executive Committee and all Members;

13.3.6 the Executive Committee shall mediate on the deadlocked resolution within 30 (THIRTY) days of referral to it;

13.3.7 if the Executive Committee is unable to mediate a resolution the deadlocked resolution will be removed from the agenda and may not be reinstated on the agenda before a lapse of at least 6 (SIX) months, except in the case of the budget in which event it shall make an arbitral ruling binding on all Members.

13.4 Powers

In addition to any others powers conferred on the General Meeting it shall have the power to.

13.4.1 Adopt the audited accounts;
13.4.2 Appoint external bookkeepers or auditors for the next Financial Year and fix their remuneration;
13.4.3 Consider all motions of which due notice was given;
13.4.4 Determine the policy and strategy for the Coordination Center;
13.4.5 Adjudicate disputes between Members pertaining to matters or the activities of the Coordination Center;

13.4.6 Approve, amend, supplement or abrogate regulations, by-laws and code of conduct;
13.4.7 Discipline any Member that has made himself guilty of misconduct or acted or refrained from acting and in so doing brought the Coordination Center into disrepute;
13.4.8 Terminate the membership of any Member provided that such Member has had the opportunity' to present his case to the General Meeting for disciplinary matters regarding Members.

ARTICLE 14: SUNDRY PROVISIONS

14.1 The Management Board Members shall not be liable (individually or collectively) for any loss of capital or part thereof of the fund resulting from the exercise of the Management Board Members of any powers or discretions in terms of this Constitution, or as a result of bona fide attempts by the Management Board Members to fulfill their functions in terms of this Constitution, or as a result of a demolition in value of the fund or any portion thereof or as a result of any shortage upon the realization of any asset of the Coordination Center, unless the Management Board Members acted in bad faith in making the investment, retaining the investment or realizing such investment or asset.

14.2 A Management Board Member shall not be liable for any unlawful act or misconduct of any other Management Board Member, unless such Management Board Member knowingly permitted such act or was an accomplice thereto.

14.3 All costs and disbursements lawfully incurred by the Management Board Members with regard to the administration of the fund, including but not limited to legal costs incurred by or against them in their capacities as such, shall be paid by the Coordination Center from the Fund.

14.4 The Management Board Members and office bearers of the Coordination Center are hereby indemnified by the Coordination Center against any claims whatsoever against the Management Board Members or office bearers away from anything done bona fide in their official capacities for or on behalf of the Coordination Center.

ARTICLE 15: AMENDMENTS

15.1 An amendment of this Constitution shall only be tabled if proposed by an Operating Member and supported in writing by at least 3 (THREE) other Operating Members and 2 (TWO) Non-Operating Members, as long as there are 2 (TWO) or more Non-Operating Members. If there are no Non-Operating Members at least 5 (FIVE) other Operating Members must support the tabling of the amendment.

15.2 This Constitution may be amended at anytime by unanimous resolution the Management Committee acting on the recommendations of the Operating Sub-Committee provided that no such amendment shall be in conflict or inconsistent with the MOU or ABOM.

ARTICLE 16: DISPUTE RESOLUTION

Any dispute or disagreement arising between the Coordination Center and any Member shall be referred by the Operating Sub-Committee to the Management Committee which shall endeavor to resolve same amicably within 10 (TEN) days of referral thereof, provided that if the Management Committee cannot for any reason resolve the dispute or if one party is aggrieved by the Management Committee's determination or ruling, the Management Committee shall, by

written notice to the parties concerned, refer the matter to the Executive Committee which shall hear and finally determine the dispute.

ARTICLE 17: NOTICES AND DOMICILUM

Any notice, document or communication required to be given or sent to or served on the Coordination Center shall be addressed to the Manager at the Coordination Center's head office which shall be the Coordination Center's address for service.

ARTICLE 18: DISSOLUTION AND CONSEQUENCES

18.1 The Coordination Center may, at any time, be dissolved and cease to function by resolution of the Management Committee; or shall be dissolved and cease to exist, upon dissolution of the SAPP.

18.2 The dissolution of the Coordination Center in terms hereof shall not adversely affect or prejudice antecedent rights of staff or creditors of the Coordination Center acquired prior to and in existence at the time of such dissolution, which rights shall be fully enforceable against the SAPP as if it was the Coordination Center

18.3 Upon dissolution of the Coordination Center, all its assets shall be collated and realized to meet any outstanding financial obligation to creditors and the balance distributed among Operating Members or disposed of in such manner as the Operating Members shall determine.

ARTICLE 19: ENTIRE CONSTITUTION AND GOVERNING LAW

19.1 This Constitution constitutes the entire constitution of the Coordination Center and shall be read with and subject to the MOU and ABOM, and any Member who breaches the provisions hereof shall be liable to receive any of the appropriate penalties or sanctions specified in the ABOM.

19.2 This Constitution shall be governed by and construed or interpreted in accordance with the laws of _____.

IN WITNESS HEREOF THIS CONSTITUTION HAS BEEN ADOPTED BY THE MANAGEMENT COMMITTEE ON THIS THE ___ DAY OF _____ AT _____

SIGNED: CHAIRMAN, SAPP MANAGEMENT COMMITTEE

WITNESS: CHAIRMAN, OPERATING SUBCOMMITTEE

SOUTH ASIA POWER POOL (SAPP)
AGREEMENT AMONG OPERATING MEMBERS

PREAMBLE

This Agreement is made and entered into by the signatories, herein referred to as "Operating Members" who are also "Members" of the South Asia Power Pool.

Signatories of this Agreement may be added from time to time provided they are also signatories of the "Inter-Utility Memorandum of Understanding" of the South Asia Power Pool.

WHEREAS, the signatories of this Agreement are Electricity Supply Enterprises in their own countries; and

WHEREAS, the "Operating Members" wish to continue with the development of interconnections between their respective networks and expand capacity and energy trade among themselves; and

WHEREAS, the "Operating Members" desire to enhance the reliability of supply to their customers and share in the other benefits resulting from the interconnected operation of their systems; and

WHEREAS, the "Operating Members" wish to create further opportunities to coordinate the installation and operation of generation and transmission facilities in their respective networks; and

WHEREAS, the "Operating Members" wish to cooperate and seek mutually beneficial arrangements wherever possible and refrain from arrangements that would be detrimental to any "Operating Member" or "Member";

NOW THEREFORE, the "Operating Members" agree to enter into this Agreement for the operation of the portion of the "South Asia Power Pool" which is interconnected.

ARTICLE 1: PURPOSE AND CONTENT OF THIS AGREEMENT

1.1 PURPOSE: The purpose of this Agreement is to establish the basic principles and rules under which the interconnected portion of the South Asia Power Pool (herein referred to as the "Pool" or the "SAPP") will operate. These are based on the need for all Operating Members:

(i) to coordinate and cooperate in the operation of their systems to minimize costs while maintaining reliability;

(ii) to fully recover their costs, and

(iii) to share equitably in the resulting benefits.

Among the benefits that will be achieved are reductions in required generating capacity, reductions in regional fuel costs and improved use of hydroelectric energy and natural gas. This Agreement establishes the rules under which these benefits can be realized, but also recognizes

that these rules and their implementation as given in the Service Schedules may be modified from time to time as conditions change.

1.2 HIERARCHY OF THE DOCUMENTS GOVERNING THE SAPP:

The following documents shall govern the establishment and administration of the SAPP. In case of inconsistency, the first document shall have precedence over the second document, the second document over the third document, the third document over the fourth document and the fourth documents over the fifth document.

(i) The Inter-Governmental "Memorandum of Understanding";
(ii) The Inter-Utility "Memorandum of Understanding";
(iii) This Agreement among Operating Members;
(iv) The "Operating Guidelines";
(v) Short Term Market Agreement/Book of Rules.

No other document can be construed as governing the establishment and administration of the SAPP.

ARTICLE 2: DEFINITIONS

In addition to the definitions given in the Inter-Utility MOU, the following definitions shall apply:

2.1 ACCREDITED CAPACITY:

The Accredited Capacity of an Operating Member shall mean its Net Generating Capacity plus Participation Power purchases minus Participation Power sales.

2.2 ACCREDITED CAPACITY OBLIGATION:

The Accredited Capacity Obligation of an Operating Member shall mean its Monthly System Peak Obligation plus its Reserve Capacity Obligation based on its Annual System Peak Obligation.

2.3 ANNUAL SYSTEM PEAK DEMAND:

The Annual System Peak Demand of a Member shall mean the highest hourly integrated system demand occurring in the supply area of such Member during the twelve month period from 1 April of a year until 31 March of the next year. This system demand shall include transmission losses but exclude the consumption of power station auxiliaries.

2.4 AREA CONTROL ERROR (ACE):

The Area Control Error shall mean the difference between actual and scheduled tie line interchanges between Control Areas, taking into account the difference between the actual and scheduled frequency.

2.5 AUTOMATIC GENERATION CONTROL:

Automatic Generation Control shall mean control instrumentation as defined in the Operating Guidelines (see also Article 5.2).

2.6 AVAILABLE ACCREDITED CAPACITY:

The Available Accredited Capacity of a Member shall mean its Accredited Capacity adjusted for

(i) generating capacity out of service for maintenance or repair,
(ii) any other miscellaneous change in capacity (see also Article 8 and Appendix 1).

2.7 AVERAGE PRODUCTION COST:

The Average Production Cost shall be defined as follows:

$$\text{Average Production Cost} = \frac{Fr+Wr+Cr+Mr+Lr}{S} \quad [\text{USD/MWh}]$$

Where:

Fr = Fuel	total cost of fuel to send out S MWh;
Wr = Water	total cost of water to send out S MWh;
Cr = Chemicals	total cost of chemicals to send out S MWh;
Mr = Maintenance	total cost of maintenance to send out S MWh;
Lr = Labor	total cost of labor to send out S MWh;
S = Sent Out Generation	This is equal to the Generated MWh less the Auxiliary Station Power MWh.

Fuel: (Fr): total cost of fuel (i.e. coal. furnace oil, nuclear fuel, gas or other). This is equal to the average cost per unit of fuel (ton. cubic meter etc.) for the year multiplied by the required quantity of fuel.

Water: (Wr): total cost of water (cooling water. potable water etc.). This is equal to the average cost of water for the year multiplied by the required quantity of water.

Chemicals: (Cr): total cost of chemicals. This is equal to the average cost of chemicals for the year multiplied by the required quantity of chemicals.

Maintenance: (Mr): 100% of the annual cost of maintenance, spares and maintenance contracts. This does not include costs of repairs that cannot be attributed to normal fair wear and tear. Station maintenance staff costs must be included in Labor,

Labor: (Lr): 100 % of the annual labor cost for station operation and maintenance staff only. No administration staff or overheads to be included.

If, in a year, a Member fails to review the costs/rates above (as specified in Article 5.6), the costs/rates in Financial Year "n+ 1" shall be equal to the costs in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-l",

2.8 COLD RESERVE:

Cold Reserve shall mean generating capacity available for operation, but not synchronized to the system. It shall be equal to Slow Reserve plus Quick Reserve.

2.9 CONTROL AREA:

Control Area shall mean an electrical system with borders defined by Points of Interconnection and capable of maintaining continuous balance between the generation under its control, the consumption of electricity in the area and the scheduled interchanges with other Control Areas.

2.10 COORDINATION CENTRE:

The Coordination Centre, shall mean a Centre as defined in Article 7. It shall report to the SAPP structures as defined in the "Inter-Utility Memorandum of Understanding" of the SAPP.

2.11 ECONOMY ENERGY:

Economy Energy shall mean energy produced at thermal power station(s) that one Operating Member purchases from another Operating Member to replace higher cost energy by lower cost energy (see also Schedule C).

2.12 EMERGENCY ENERGY:

Emergency Energy shall mean energy supplied from other Operating Members to an Operating Member who experiences a loss of generating or transmission facilities as the result of an unscheduled outage (or outages) or any cause not reasonably foreseeable. Such energy shall be available for a period of six hours starting from the occurrence of the emergency, after which the Operating Member must obtain other types of services or shed load, should the shortage continue (see also Article 5.1 and Schedule A).

2.13 EMERGENCY SITUATION:

An Emergency Situation shall mean a situation where a Member is faced with an unplanned loss of generation or transmission facilities or another situation beyond its control that impairs or jeopardizes its ability to supply its System Demand, adjusted for imports and exports of Firm Power. Such emergency shall not exceed six hours.

2.14 ENERGY BANKING:

Energy Banking or "Banking" shall mean an arrangement whereby one Operating Member can store energy in the system of another Operating Member and withdraw it at mutually agreed times (see also Schedule E).

2.15 ESCALATION:

Escalation (or Standard Escalation) in a time interval, shall mean the ratio of the Production Price Index as issued monthly by the Department of Commerce of the Federal Government of the United States of America at the end of the interval divided by the same index at the beginning of the interval.

2.16 FINANCIAL YEAR:

Financial Year shall mean a twelve-month period starting on 1 April of a year and ending on 31 March of the following year.

2.17 FIRM POWER:

Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction. Unless arranged separately through another contract, Firm Power shall include the necessary Reserve Capacity to ensure adequate reliability of supply (see also Schedules F and K),

2.18 FORCE MAJURE:

Force Majeure shall mean any of the following:

2.18.1 any overwhelming occurrence of nature which could not reasonably have been foreseen or guarded against;

2.18.2 any of the following occurrences initiated by human agency: war, blockade. foreign hostile acts, civil war. rebellion, revolution, insurrection or sabotage;

2.18.3 strikes or other similar stoppages of work by employees that are not caused by unreasonable actions on the part of a Member;

2.18.4 any other cause beyond the control of a Member or a Member experiencing such cause and another affected Member(s) agreeing by mutual negotiation or otherwise, that such cause should be regarded as Force Majeure.

2.19 INADVERTENT ENERGY FLOW:

Inadvertent Energy Flow shall mean the difference between the net scheduled energy delivered and the actual net energy delivered in any specific hour.

2.20 INTERRUPTIBLE OR CURTAILABLE LOAD:

Interruptible or Curtailable Load shall mean a consumer load or a combination of consumer loads which can be contractually interrupted or reduced by remote control or on instruction from the Member where such contracts are in place and such instructions have been given from the Member's Control Centre. The notice that such an interruption or reduction will take place shall be less than the time specified in the Operating Guidelines for Quick Reserve to be converted into power and energy.

2.21 LEVELIZED COST:

Levelized cost shall mean an amount expressed in constant money value (i.e. assuming constant purchasing power) and repeated every year over the life of the plant, which accumulates to a present value equal to the actual expenditure incurred. This expenditure may cover capital costs, production costs or any other type of cost.

2.22 MONTHLY SYSTEM PEAK DEMAND:

The Monthly System Peak Demand of a Member shall mean the highest hourly-integrated system demand occurring in the supply area of such a Member during a calendar month. This system demand shall include transmission losses, but exclude the consumption of power station auxiliaries.

2.23 MOTHBALLED CAPACITY:

Mothballed Capacity shall mean thermal plant which is dry stored, sometimes partially dismantled and which is specifically protected for a storage period longer than one year, but which can be returned to operating status within three (3) years.

2.24 NET GENERATING CAPACITY:

The Net Generating Capacity of a Member shall mean that capacity in MW that the generating facilities of such Member can supply simultaneously to its system and other systems at the time of its Monthly System Peak Demand. The generating units of a Member which are out of service for maintenance or repair for less than four {4) consecutive months as well as capacity in Cold Reserve which car, be re-commissioned within two {2) months shall be included in the Net Generating Capacity.

2.25 OPERATING RESERVE:

Operating Reserve shall mean the unused capacity above System Demand that is required to cater for regulation short-term load forecasting errors and Unplanned Outages. It must be available within the time prescribed in the Operating Guidelines and consists of Spinning and Quick Reserve (see Schedule H).

2.26 OPERATING RESERVE OBLIGATION:

Operating Reserve Obligation shall mean the amount of Operating Reserve that an Operating Member is obliged to maintain in terms of the Operating Guidelines. The Operating Reserve Obligation can be met by own plant or by contract.

2.27 PARTICIPATION POWER:

Participation Power shall mean the lease of a specific generating unit (or units) or a portion of such unit(s) and the sale of its production by one Operating Member to another Operating Member. This capacity and energy shall be continuously available except when such unit (or units) is out of service for maintenance or repair during which time the delivery of energy from other sources shall be at the Seller's discretion (see Schedules G and L).

2.28 PLANNED OUTAGE:

Unless otherwise agreed between all relevant Control Centres. Planned Outages shall mean outages that are scheduled with the advance notice specified in the Operating Guidelines.

2.29 POINTS OF INTERCONNECTION:

The Points of Interconnection between Operating Members shall be those locations where their respective transmission facilities are physically connected. Unless otherwise agreed, the transactions under the Service Schedules shall be deemed to take place at the Points of Interconnection. The Management Committee shall update, from time to time, the list giving the Points of Interconnection between the networks of the Operating Members.

2.30 POOL OPERATING RESERVE OBLIGATION:

The Pool Operating Reserve Obligation shall mean the amount of Operating Reserve that must be collectively maintained by the Operating Members in terms of the Operating Guidelines.

2.31 QUICK RESERVE:

Quick Reserve shall mean curtailment of load or capacity readily available from Cold Reserve that can be made available within the time period specified in the Operating Guidelines.

2.32 RESERVE CAPACITY:

The Reserve Capacity of a Member (in a time interval) shall mean the excess in MW of such Member's Accredited Capacity above its System Peak Obligation in the same time interval (i.e., year, month, week, etc.). Alternatively, the Reserve Capacity can also be expressed in percent of the Member's System Peak Obligation.

2.33 RESERVE CAPACITY OBLIGATION:

The Reserve Capacity Obligation of a Member shall mean the amount of Reserve Capacity that such Member is obliged to maintain in terms of this Agreement. Reserve Capacity Obligation shall be equal to the Annual System Peak Obligation multiplied by the percentage (%) reserve level specified in Appendix 1.

2.34 RESERVE. STORAGE:

Reserve Storage shall mean thermal plant that is stored for more than three months in a wet or dry condition. Some auxiliary plant can be run occasionally to prevent degradation.

2.35 SERVICE SCHEDULES:

Service Schedules shall mean schedules governing various types of transactions that may be entered into between Operating Members to reduce costs or improve reliability of supply. They are dealt with in Article 9 and Appendix 2 hereto.

2.36 SHORT RUN MARGINAL COST OF GENERATION:

The Short Run Marginal Cast of Generation {SRMC) shall be defined as follows:

$$SRMC = \frac{F+W+C+M+L}{S} \quad \text{(US Dollar/MWh)}$$

Where:

F = Fuel variable cost of fuel to send out S MWh;
W = Water variable cost of water to send out S MWh;
C = Chemicals variable cost of chemicals to send out S MWh;
M = Maintenance variable cost of maintenance to send out S MWh, deemed to be 20% of total maintenance costs;
L = Labor variable cost of labor to send out S MWh, deemed to be 10 % of total labor costs:

S = Send Out Generation This is equal to the Generated MWh less the Auxiliary Station Power MWh

Fuel: (F): variable cost of fuel (i.e. coal, furnace oil. nuclear fuel, gas or other). This is equal to the average variable cost per unit of fuel (ton, cubic meter etc.) for the year multiplied by the required quantity of fuel.

Water: (W): variable cost of water (cooling water, potable water etc.). This is equal to the average variable cost of water for the year multiplied by the required quantity of water.

Chemicals (C): variable cost of chemicals. This is equal to the average variable cost of chemicals for the year multiplied by the required quantity of chemicals.

Maintenance (M): 20 % of the total cost of annual maintenance spares and maintenance contracts. This does not include costs of repairs that cannot be attributed to normal fair wear and tear. Station maintenance staff costs must be included in Labor.

Labor (L): 10 % of the annual labor cost for station operation and maintenance staff only. No administration staff or overheads to be included.

If, in a year, a Member fails to review the costs above (as specified in Article 5.6), the costs in Financial Year "n+ 1" shall be equal to the costs in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-l".

2.37 SLOW RESERVE:

Slow Reserve shall mean capacity readily available from Cold Reserve and considered to be ready for synchronization to the system within the time period specified in the Operating Guidelines. The purpose of Slow Reserve is to replace any generating unit on unplanned outage or to meet an unexpected surge in demand.

2.38 SPINNING RESERVE:

Spinning Reserve shall mean the unused capacity of synchronized generating units that can be delivered without manual intervention within the time period specified in the Operating Guidelines.

2.39 SPINNING RESERVE OBLIGATION:

Spinning Reserve Obligation shall mean the amount of Spinning Reserve that a Member is obliged to keep or contract for in terms of the Operating Guidelines.

2.40 SURPLUS ENERGY:

Surplus Energy shall mean hydro energy purchased by one Operating Member from another Operating Member to replace higher cost energy by lower cost energy (see also Schedule D).

2.41 SYSTEM DEMAND:

The System Demand of a Member shall mean the number of MW that is equal to the number of MWh required in any clock hour to supply the consumers of electricity in the supply area of such a Member. It includes transmission losses but excludes the consumption of power station auxiliaries.

2.42 SYSTEM ENERGY:

System Energy shall mean energy purchased by one Operating Member from another Operating Member to defer the use of fuel or water, to reduce transmission losses, to offset outages of generating units, to improve environmental conditions or for any other reason of a similar nature (see also Schedule B).

2.43 SYSTEM PEAK OBLIGATION (ANNUAL OR MONTHLY):

The Annual or Monthly System Peak Obligation of a Member shall mean its Annual or Monthly System Peak Demand minus the Firm Power purchases scheduled for that month plus the Firm Power Sales scheduled for the same month.

2.44 UNPLANNED OUTAGE:

Unless otherwise agreed between all relevant Control Centres, Unplanned Outages shall mean outages that are not scheduled with the advance notice specified in the Operating Guidelines.

2.45 WHEELING:

Wheeling shall mean transmitting a contractual amount of power over specified time periods through the system of an Operating Member who is neither the Seller nor the Buyer of this power {see also Schedule I).

ARTICLE 3: COMMENCEMENT AND TERMINATION OF THIS AGREEMENT

3.1 COMMENCEMENT DATE:

Upon signature by the relevant Operating Members, this Agreement shall be implemented in several stages in accordance with what is technically and administratively feasible, as new interconnections between Members and transmission of data between Control Centres become operational. It shall remain in effect until terminated in accordance with Article 3.2 below.

3.2 TERMINATION:

Any Operating Member may terminate its participation in the Agreement among Operating Members as of midnight of 31 December _____ or as at midnight on 31 December of any year thereafter by delivering written notice of such termination at least forty-eight (48) months in advance to every other Member to allow for re-planning of transmission and generating facilities.

If such termination results in a physical separation of the interconnected system within the SAPP, the existence of this Agreement in its original form shall come to an end. Any unfulfilled duties including financial obligations existing as a result of the interconnected operation of the Pool at the date of termination shall still continue in full force until such items have been fulfilled or have expired.

3.3 RESTORATION:

Any Member or group of Members shall then have the right to restore the interconnected operation of the Pool as governed by the documents listed in Article 1.2 by re-establishing one or more interconnections with another Member or Members.

ARTICLE 4: MEMBERSHIP:

4.1 MEMBERSHIP:
An Electricity Supply Enterprise, as defined in Article 3.3 of the "Inter-Utility Memorandum of Understanding":

(i) which is a Member of the SAPP;

(ii) which is interconnected with other Member(s) of the SAPP;

(iii) which undertakes to comply with all the rules and requirements specified in this Agreement and in the Operating Guidelines;

may become an Operating Member of the South Asia Power Pool by signing this Agreement. Admission as full Operating Member shall require a two-thirds majority by the Members of the Executive Committee who are already signatories of this Agreement.

4.2 OBSERVER STATUS:

By consensus, or failing this, by a two-thirds majority, the Executive Committee may grant, upon approval by the Council of SAARC Ministers of Energy, observer status to an Electricity Supply Enterprise interested in the interconnected operation of the Pool. Electricity Supply Enterprises having obtained observer status shall all have the same rights and obligations as specified in advance by the Management Committee.

4.3 INDEPENDENT POWER PRODUCERS:

An Independent Power Producer may become an Operating Member of the SAPP and the procedure or criteria for acceptance shall be the same as for Electricity Supply Enterprises. This membership shall however be of a limited nature: such Operating Member shall be entitled to participate in the Operating and Planning Sub-Committees, but not in the Management or the Executive Committees of the SAPP.

ARTICLE 5: RIGHTS AND OBLIGATIONS OF THE OPERATING MEMBERS:

(See also Article 7 in the "Inter-Utility Memorandum of Understanding")

5.1 EMERGENCY ENERGY:

As soon as an Emergency Situation develops in the system of an Operating Member, the other Operating Members shall supply Emergency Energy up to the full amount of their Available Accredited Capacity, provided the Operating Member experiencing the Emergency Situation complies with the provisions of Service Schedule A. In terms of priority, Emergency Energy shall over-ride all non-firm types of transactions. Operating Members whose facilities are required to wheel Emergency Energy to the Operating Member experiencing an emergency, shall be obliged to make these facilities available on a firm basis for the duration of the emergency (i.e., not exceeding 6 (six) hours), subject exclusively to technical limitations in terms of the Operating Guidelines.

5.2 AUTOMATIC GENERATION CONTROL:

Every Operating Member shall provide in its own Control Area the Automatic Generation Control (AGC), telemetering and telecommunication facilities that are specified in the Operating Guidelines. If such AGC facilities ore not in service, the Member shall contract with another Operating Member to become part of its Control Area (see Schedule M). As long as this is not done, the Operating Member's tie line(s) with the rest of the Pool shall remain open, unless otherwise agreed by the Operating Sub-Committee.

5.3 WHEELING:

Each Operating Member of the Pool undertakes to allow the wheeling of capacity or energy through its system where this is technically and economically feasible, subject to the conditions specified in Schedule I. When such wheeling endangers the wheeler's facilities or interferes with its obligations towards its own customers or other Members this shall be brought to the attention of the Operating Sub-Committee.

5.4 ACCREDITED CAPACITY OBLIGATION:

Each Operating Member shall comply with its Accredited Capacity Obligation as specified in Article 8 and Appendix 1.

5.5 MAINTENANCE SCHEDULES:

Maintenance Schedules leading to Planned Outages of generation and Transmission facilities shall be submitted to the other Operating Members and to the Operating Sub-Committee in the manner prescribed from time to time by the Operating Sub-Committee.

5.6 DISCLOSURE OF COSTS AND OTHER PARAMETERS:

The Operating Members shall disclose all information and costs relating to their generating facilities in the manner prescribed by the Planning Sub-Committee. In particular, Members having thermal generation shall provide details of their Average Production Cost and Short Run Marginal Cost of Generation at each of their thermal generating facilities.

ARTICLE 6: OPERATING SUB-COMMITTEE:

(See also Article 14 of the "Inter-Utility Memorandum of Understanding").

The duties of the Operating Sub-Committee shall include, but shall not be limited to, the following:

6.1 Approve the methods and standards used for testing generating units in order to establish their sent out generating capacity.

6.2 Conduct short-term (maximum three years) system reliability studies as required, using inter alia, the reliability criteria specified by the Planning Sub-Committee or in the Service Schedules.

6.3 Establish and review the methods and standards (e.g. UNIPEDE) used to measure the performance (planned and forced outage rates. mean time to failure, etc.) of generating units and transmission facilities.

6.4 Establish and review the formula to derive the Operating Reserve Obligations of the Operating Members (as specified in the Operating Guidelines) and ensure that these obligations are met.

6.5 Determine annually the System Peak Obligation and the Accredited Capacity Obligation of each Operating Member for each month of the next twelve (12) months. Each Operating Member shall be required to provide plans for meeting its monthly Accredited Capacity Obligation for each of the next twelve (12) months.

6.6 Establish and update the Operating Guidelines and resulting procedures for the operation of the Pool. Such procedures shall deal with, but shall not be limited to transfer limits, frequency control, voltage control, tie-line power control, Automatic Generation Control, data exchanges, telecommunication, switching, safety, load shedding, restoration of supply and the application of Service Schedules.

6.7 Coordinate the generation and transmission maintenance schedules of the Operating Members, so as to maintain at all times, the required reserves and the agreed upon services.

6.8 In cooperation with the Operating Members of the Planning Sub-Committee, establish and update standards and procedures applicable to the Service Schedules and review their order of priority; submit proposals to the Operating Members of the Management Committee.

6.9 Establish short-term transfer limits between the systems of the Operating Members (adjacent and non-adjacent systems).

6.10 Ensure that each Operating Member is equipped with or contracts for the required Automatic Generation Control (AGC), telemetering and telecommunication facilities in accordance with the Operating Guidelines.

6.11 Determine the Net Generating Capacity in the Member's systems.

6.12 Evaluate software and other tools that will enhance the value of Pool operations in areas such as unit commitment, overall generation dispatch or reliability monitoring; submit proposals to the Operating Members of the Management Committee.

6.13 Review and submit the budget for the operation of the Coordination Centre to the Management Committee for approval.

6.14 Determine payments of penalties for insufficient Accredited Capacity and administer the rules governing the accreditation of a Member's Net Generating Capacity.

ARTICLE 7: COORDINATION CENTRE

7.1 FORMATION:

The Coordination Centre {CC) shall be implemented as an independent and neutral entity located at a permanent location and funded by the Members of the Pool. The Coordination Centre shall be implemented in stages as recommended by the Operating Sub-Committee and agreed upon by the Management Committee.

7.2 REPORTING STRUCTURE:

The Manager of the Coordination Centre shall be appointed on a contract basis by the Management Committee upon recommendation of the Operating Sub-Committee and shall report to the Operating Sub-Committee.

7.3 STAFFING:

The Manager of the Coordination Centre shall recruit and appoint the staff required to operate the Centre.

7.4 FUNCTIONS:

The responsibilities of the CC shall include, but shall not be limited, to the following:

7.4.1 Monitor continuously the operation of the Power Pool;

7.4.2 Monitor transactions between Operating Members and between Members and non-Members;

7.4.3 Monitor time correction procedures;

7.4.4 Monitor the inadvertent power flows and the returns in kind between the Members;

7.4.5 Provide routine daily reports, data and information relevant to the operation of the Power Pool to the Operating Sub-Committee and to the Members;

7.4.6 Monitor and advise on the use of the Operating Guidelines;

7.4.7 Monitor and report on the control performance criteria, as specified in the Operating Guidelines, to all the Operating Members;

7.4.8 Convene, following a disturbance affecting the parallel operation of the Pool, a post disturbance committee;

7.4.9 Provide information and give technical advice/support to Members of the SAPP, in matters pertaining to parallel operation;

7.4.10 Evaluate the impact of future projects on the operation of the Pool and advise the Operating Sub-Committee accordingly;

7.4.11 Perform various operational planning studies to highlight possible operating problems;

7.4.12 Give advice on short-term and long-term operating problems;

7.4.13 Perform studies to determine transfer limits on tie lines and inform Operating Members accordingly. Monitor adherence of Operating Member5 to these limits;

7.4.14 Establish and update a data base containing historical and other data to be used in Planning and System Operation studies;

7.4.15 Monitor the availability of the communication links between the Control Centres of the Operating Members and between these Control Centres and the Coordination Centre;

7.4.16 Advise on the feasibility of wheeling transactions;

7.4.17 Gather and act as the official custodian of data pertaining to transactions between Operating Members and between Operating Members and non-Members;

7.4.18 Monitor the calculation and implementation of the various types of reserves;

7.4.19 Carry out projects and assignments as directed by the Operating Sub-Committee;

7.4.20 Monitor the projection performance on all tie lines;

7.4.21 Monitor the coordination of protection on all tie-lines;

7.4.22 Monitor adherence to the Agreement by the Operating Members, inter alia, regarding Accredited Capacity Obligation and calculate the penalties for insufficient Accredited Capacity and their re-allocation among Members;

7.4.23 Disseminate the generation and transmission maintenance schedules received from the Operating Members and advise on the adjustments that are required to maintain at all times the contractual Pool reserves and the agreed upon services;

7.4.24 Coordinate the training of the Member's staff and, if necessary, organize training seminars focusing on the operation of the interconnected system.

7.4.25 Coordinate the training of the Member's staff and, if necessary, organize training seminars focusing on the operation of the interconnected system.

7.4.26 Coordinate the training of the Member's staff and, if necessary, organize training seminars focusing on the operation of the interconnected system.

7.4.27 Endeavor to obtain funding for the capital projects of the Co-ordination Centre upon the approval by the Operating Sub-Committee;

7.4.28 Prepare and present an annual budget covering the Coordination Centre expenditure for approval by the Operating Sub-Committee;

7.4.29 Produce a monthly financial statement as specified by the Operating Sub-Committee.

7.5 COSTS:

7.5.1 ANNUAL COSTS:

Members will pay their contributions up front for the Financial Year based on the approved budget of the Coordination Centre. The contributions shall be calculated in accordance with Article 7.5.3.

7.5.2 ADDITIONAL COSTS:

If the Co-ordination Centre Manager foresees that a shortage of funds will arise before or at the end of the Financial Year, he must explain the variance to the Operating Sub-Committee and apply for additional funds. These additional funds shall be approved by the Management Committee upon recommendation by the Operating Sub-Committee. The additional contribution of each Member shall again be calculated in accordance with Article 7.5.3.

7.5.3 ALLOCATION BETWEEN MEMBERS:

The allocation between the Members of the costs budgeted by the Coordination Centre shall be as follows:

(1) 30 % (thirty per cent) shall be shared equally between all the Operating Members.

(2) 30 % (thirty per cent) shall be allocated between the Operating Members in proportion to the actual energy measured in MWh and imported from other Members or other Parties during the Financial Year.

(3) 20 % (twenty per cent) shall be allocated between all SAPP Members in proportion to their Annual System Peak Demand in the Financial Year.

(4) 10 % (ten per cent) shall be allocated between Operating Members in proportion to the combined 75C thermal rating of their interconnections with other Members.

(5) 10 % [ten per cent) shall be deemed to constitute a benefit payable only by the host Member.

The terms of Article 11.3, where applicable, shall apply to the monies due to the Coordination Centre.

7.5.4 BUDGET AND FINANCIAL RECORDS:

(1) the budget shall include all the Coordination Centre expenses, i.e. operating costs. staff salaries or capital expenditure etc.;

(2) a record shall be kept of all expenses incurred by the Coordination Centre;

(3) financial statements shall be prepared and issued for each Financial Year, at the latest. six months after the end of the Financial Year;

(4) the remuneration package and salary adjustments of the staff shall be determined by market rates.

ARTICLE 8: ACCREDITED CAPACITY OBLIGATION:

8.1 REQUIREMENTS:

The Accredited Capacity Obligation of each Operating Member shall be determined as follows and the penalties for not complying 'shall be calculated in accordance with Appendix 1.

8.1.1 Over each calendar month every Operating Member of the Pool shall provide an Accredited Capacity at least equal to its Accredited Capacity Obligation in that month as specified in Appendix 1. The Accredited Capacity Obligation shall be equal to the Monthly System Peak Obligation, plus the Reserve Capacity Obligation based on the Annual System Peak Obligation.

8.1.2 The Reserve Capacity Obligation of a Member for any month shall be as specified in Appendix 1.

8.1.3 In respect to commitments of power from or to an Electricity Supply Enterprise, which are not covered by the Service Schedules of this Agreement, but are under separate contracts now existing or hereafter created, such commitments shall be reflected in a Member's System Peak Obligation (Annual and Monthly) as the case may be.

8.1.4 Prior to the beginning of each calendar month, an Operating Member that does not meet its Accredited Capacity Obligation under Article 8.1,1, shall acquire additional capacity or reduce its System Peak Obligation so as to meet it. This can be done as follows:

(i) by advancing the completion date of new facilities.

(ii) by purchasing Firm Power (Service Schedules F and K) from Operating Members or non-Members of the Pool;

(iii) by purchasing or leasing capacity from one or more generating units from outside its system such as with Participation Power (Service Schedules L and G);

(iv) by reducing its Monthly System Peak Obligation;

8.1.5 The System Peak Obligation and the Accredited Capacity Obligation of each Operating Member shall be determined annually by the Operating Sub-Committee for each of the next twelve (12) months, as specified in Article 6.5 and Appendix 1.

8.1.6 Nothing contained in this Agreement shall be interpreted to require a Member to install facilities or to restrict a Members' choice to install facilities or purchase power to maintain its Accredited Capacity.

8.2 FAILURE TO COMPLY:

8.2.1 If in any month, the Accredited Capacity Obligation of an Operating Member is not fulfilled, such Member shall be charged for the number of megawatts required to fulfill the obligation multiplied by the penalty rate given in Appendix 1.

8.2.2 The payments by deficient Operating Members under Article 8.2.1, shall be split among the Members having a surplus of Accredited Capacity following the method given in Appendix 1,

8.2.3 If an Operating Member increases its Accredited Capacity or reduces its System Peak Obligation after the beginning of the month, then the penalty to be paid by this Operating Member shall be proportionally adjusted to take into account the number of full days the Accredited Capacity was at the higher level or the System Peak Obligation was at the lower level.

8.2.4 Any dissenting Operating Member may refer the matter to the Management Committee. This shall be done in writing within fourteen (14) days that the disagreement regarding Accredited Capacity has arisen.

ARTICLE 9: SERVICE SCHEDULES

9.1 LIST OF SERVICES:

The services available under this Agreement are given in the Service Schedules of Appendix 2 and are as follows:

"A" EMERGENCY ENERGY

"B" SYSTEM ENERGY

"C" ECONOMY ENERGY

"D" SURPLUS ENERGY

"E" ENERGY BANKING

"F" SHORT-TERM FIRM POWER

"G" SYSTEM PARTICIPATION POWER

"H" OPERATING RESERVE

"I" WHEELING

"J" SCHEDULED OUTAGE ENERGY

"K" FIRM POWER

"L" PARTICIPATION POWER

"M" CONTROL AREA SERVICES

9.2 RATES APPLICABLE TO THE TRANSACTIONS:

For any transaction the relevant rate(s) or price(s) shall be that which has been quoted and agreed upon before the start of the transaction. The said rate(s) or price(s) shall remain as agreed for the whole duration of the transaction. Other issues relating to transactions are dealt with in Article 11 "Settlements" and in the "Schedules" of Appendix 2.

9.3 AMENDMENTS AND UPDATES:

Service Schedules for capacity, energy, wheeling or any other service, may be added, amended or updated from time to time. The new versions shall be prepared by the Operating Members of the Planning Sub-Committee in consultation with the Operating Sub-Committee, reviewed by the Management Committee and approved by the Executive Committee in accordance with the provisions of the Inter-Utility MOU.

9.4 CONTINUITY OF SUPPLY:

9.4.1 Capacity and Energy agreed upon under this Agreement shall be fully delivered at all times as scheduled except where interruptions or curtailments are caused by Force Majeure or by the operation of protection schemes or by the installation, maintenance, repair and replacement of facilities where such events were unforeseeable and therefore notice could not be given. Such events shall not be a breach of this Agreement.

9.4.2 Where any of these events can be pre-planned, every Operating Member of the Pool shall give one (1) month notice to the other Operating Members and shall schedule such events so as to cause as little inconvenience as possible to the other Members. Failure to give such notice shall be a breach of this Agreement.

9.4.3 The provision of penalties or bonuses, if any, shall be dealt with separately in the specific transactions or agreements between Operating Members.

9.5 ACTIVE AND REACTIVE POWER FLOWS:
The Operating Members recognize that the flows of power between their respective systems are governed by physical laws and that power delivered under this Agreement will flow through paths determined by the physical parameters of the network.

9.6 HARDSHIP CAUSED TO OTHER MEMBERS:

Each Operating Member shall at all times co-operate to ensure that:

9.6.1 no overload or damage to equipment is caused to other Members or any other party by power flows of scheduled deliveries;

9.6.2 no overload or damage to equipment is caused to other Members or any other party when abnormal conditions or Force Majeure arises.

ARTICLE 10: METERING

10.1 METERING EQUIPMENT:

Metering equipment as well as telemetering and communication facilities shall be installed so as to determine the actual flows of active and reactive power at the Points of interconnection.

10.2 RECONCILIATION:

Where meters are temporarily not equipped with communication facilities as specified in Clause 10.1, the differences between locally metered figures and those quantities used in daily energy accounting shall be reconciled monthly.

10.3 TESTING:

Metering equipment shall be tested by the owner as recommended by the Operating Sub-Committee. In addition, special tests shall be made on request by any other Operating Member. If the meter complies with the specified accuracy, then the Member who has requested the tests shall bear the costs thereof. Otherwise, the costs of such tests shall be borne by the owner of the meter. Representatives of any Member shall be given the opportunity to witness the tests.

10.4 ACCOUNT ADJUSTMENTS:

If the accuracy of the meter(s) is not as specified, the accounts between the Operating Members shall be adjusted to correct for the full inaccuracy. Such adjustment shall be limited to the current month, unless it is possible to determine the period over which such inaccuracy occurred. In that case, the correction must be done for the full period of inaccuracy.

ARTICLE 11: SETTLEMENTS.

11.1 RECORDS AND ACCOUNTING:

Each Operating Member of the Pool shall maintain and keep for sixty (60) months an accurate record of the Capacity and Energy scheduled and delivered. It shall disclose such information to the other Operating Members and to the Co-ordination Centre once it is established.

11.2 INADVERTENT ENERGY FLOWS:

11.2.1 Inadvertent energy flows shall be returned during a time period when they have approximately the same value as when they occur. The implementation of this principle shall be as defined in the Operating Guidelines.

11.2.2 Regular checks of inadvertent energy flows shall be carried out in accordance with the Operating Guidelines.

11.3 ACCOUNTS:

11.3.1 Monthly accounts shall be prepared and sent by the Operating Members themselves and shall be settled monthly in cash unless otherwise agreed. In this context, a month shall mean a calendar month, unless otherwise approved by the Management Committee.

11.3.2 For billing purposes, the amounts of energy delivered and the amounts of generation or transmission capacity involved in a transaction (including wheeling) shall be the amounts scheduled in advance at the Points of Interconnection.

11.3.3 When Wheeling takes place, the purchasing Member shall be liable for the additional losses (positive or negative) incurred in the wheeler's system. Unless otherwise agreed between all the relevant parties, the payment for additional losses (positive or negative) in the wheeler's system shall be returned in kind in the form of hourly schedules for additional capacity determined in advance and purchased by the purchasing Member from the selling Member so as to make the transaction neutral from the point of view of losses in the wheeler's system. The amount or additional losses shall be determined in accordance with Service Schedule I.

11.3.4 To facilitate and simplify payment procedures, Operating Members may provide services in exchange for other services, rather than for cash payments. These exchanges must be acceptable to the Pool as a whole or to the other Operating Members involved, as appropriate.

11.3.5 Unless otherwise agreed, the bills shall be settled within forty-five (45) days without any deduction whatsoever and returns in kind shall take place as agreed between the relevant Members. Any unpaid amount shall bear interest from the date due until the date of payment and the annual interest rate shall be 150 % of the three (3) month United States Treasury Bill as published in the Wall Street Journa1.

11.3.6 All bills under this Agreement shall be in US Dollars, unless otherwise agreed between the relevant Members.

11.3.7 (i) If a bill is submitted by an Operating Member to another Operating Member for a service which is not Emergency Energy and the bill exceeds the amount resulting from scheduled transactions by more than150 %, the debtor Member shall have the right to pay only the amount resulting from scheduled transactions.

(ii) With regards to the excess, the debtor Member shall give notification in writing to the other Member and to the Coordination Centre within fourteen (14) days from the date of receiving the bill. stating the reasons for the dispute and the amount in dispute.

(iii) If settlement of the dispute is in favor of the creditor Member, interests as calculated in Article 11.3.5 shall apply to the amount in dispute.

11.3.8 If a Member wants to dispute all or any part of the charges submitted by another Member when these charges cover Emergency Energy or exceed scheduled transactions by less than 50 %, the Member shall nevertheless pay the full amount when due and give notification in writing to the other Member and to the Coordination Centre within fourteen (14) days from the date of receiving the bill stating the grounds for the dispute and the amount in dispute. If settlement of the dispute results in a refund to the payee, interest as calculated in Article 11.3.5 above shall be added to the refund.

11.3.9 (i) Failure to settle, inclusive of interest, a bill which is not in dispute within a period of three (3) months from the date due shall give the creditor Member the right to request the Management Committee to revoke from the debtor Member the privilege of buying or selling Economy Energy and Surplus Energy (as per Service Schedules) until the debt is settled,

(ii) If three (3) months after that date, the debtor Member has still failed to settle his debt in full, inclusive of interest, the creditor Member shall have the right to request the Management Committee to revoke the privilege of using any Service Schedule except Wheeling for future transactions from this debtor Member until its debt is settled.

(iii) The Management Committee shall be obliged to comply with the request of the creditor Member for revoking the privileges of the debtor Member upon submission of proof that financial obligations have not been fulfilled for the specified periods.

(iv) In all cases, the debtor Member shall continue to be under the obligation to wheel and shall be entitled to the proceeds of wheeling transactions in accordance with Service Schedule I.

11.4 TAXES:

11.4.1 Any tax imposed by the Government or any other authority of the country of an Operating Member (the first Member) and levied upon or measured by capacity or energy exported to or Imported from other Member(s), shall be borne and paid for by the first Member in such a way that transactions are settled by the other Operating Member(s) as if there had been no such tax.

11.4.2 The first Member indemnifies any other Member against any loss or damage that such other Member may suffer if, under Article 11.4.1 above, the first Member fails to pay such tax timely or at all.

ARTICLE 12: FAILURE TO COMPLY WITH THIS AGREEMENT

12.1 DISPUTE RESOLUTION:

12.1.1 Disputes between Operating Members concerning the interpretation of this Agreement or arising out of the nonobservance or non-performance of any portion of this Agreement, shall be brought by the aggrieved Member to the attention of the Chairperson of the next meeting of the Management Committee who within thirty (30) days shall call a meeting of the Operating Members of the Management Committee. At this meeting, the Member(s) claiming that the Agreement is not being complied with, shall present material evidence to support its (their) claim. This evidence shall have been forwarded by the aggrieved Member at least two weeks before the meeting to the Member or Members against which the complaint is being lodged.

12.1.2 The Operating Members of the Management Committee may choose by a simple majority to hear both sides to a dispute and fender a judgment based on simple majority. In this case, the Members involved in the dispute may elect to abide by the decision of the Operating Members of the Management Committee; they shall refer the matter to the Executive Committee if anyone Member in dispute feels that the decision of the Management Committee is not fair.

12.1.3 Alternatively, the Operating Members of the Management Committee may by a simple majority decision refer the matter directly to the Executive Committee without hearing it themselves.

12.1.4 If the Operating Members of the Management Committee cannot arrive at a decision either concerning the judgment in a dispute or whether the matter should be dealt with by the Committee itself or by the Executive Committee the matter shall be referred to the Executive Committee.

12.1.5 The Operating Members of the Executive Committee may choose by a simple majority to hear both sides to a dispute and render a judgment based on simple majority. In this case, the Members involved in the dispute may elect to abide by the decision of the Operating Members of the Executive Committee; otherwise they shall refer the matter to Arbitration in accordance with Article 3 if at least one Member feels that it is disadvantaged by the decision of the Executive Committee.

12.1.6 Alternatively, the Operating Members of the Executive Committee may by a simple majority decision refer the matter directly to Arbitration without hearing it themselves.

12.1.7 If the Operating Members of the Executive Committee cannot arrive at a decision either concerning the judgment in a dispute or whether the matter should be dealt with by tile Committee itself or by Arbitration, the matter shall be referred to Arbitration as provided in Article 13.

12.1.8 In all cases, the Arbitration ruling shall be final and not open to appeal. A Member not abiding by the ruling shall be in breach of this Agreement.

12.2 FAILURE TO COMPLY:

12.2.1 An Operating Member that persistently fails to comply with the Agreement or with an Arbitration ruling shall be issued with a warning letter by the Operating Members of the Management Committee requesting the Member to submit plans for meeting reasonable levels of compliance. The non-complying Member shall acknowledge tile letter within thirty {30) days and shall propose corrective action within three (3) calendar months to resolve the problem.

12.2.2 If the non-complying Operating Member fails to make appropriate corrections, a final warning letter will be sent at the discretion of the Operating Members of the Management Committee and the issue will be remanded to the Operating Members of the Executive Committee to take one of the following actions:

Level 1: revoke tile privilege to use Economy Energy and Surplus Energy (as per Service Schedules C and D) until compliance is restored;

Level 2: revoke the privilege of using any Service Schedule except Wheeling for future transactions until compliance is restored;

Level 3: revoke Operating membership of the SAPP.

ARTICLE 13: ARBITRATION

13.1 PROCEDURE:

13.1.1 In the event of a disagreement or a dispute between Operating Members at the Executive Committee concerning the interpretation of this Agreement or arising out of the non-observance or non-performance of any portion of this Agreement or when a Member has elected not to abide by the decision of the Executive Committee as per Article 12.1.5, the dissenting Member or Members shall within thirty (30) days appoint one Arbitrator and the other Member(s) shall appoint another Arbitrator.

13.1.2 The Arbitrators shall, in turn, appoint within thirty (30) days of their appointment a third Arbitrator by consensus. All Arbitrators shall be individuals known internationally for their expertise in the specific problem causing the dispute. The procedure by which the Arbitrators will reach a decision shall be laid down by the Arbitrators themselves without reference to statutory requirements applicable to arbitration.

13.2 DECISIONS:

The decision(s) of the Arbitrators shall be by simple majority within ninety (90) days that they have all been appointed, unless a longer period is mutually agreed between the Members in dispute. The decisions of the Arbitrators shall be binding on all Members.

13.3 COSTS:

The costs of arbitration shall be equally spread between all the Members involved in the dispute unless the majority decision of the Arbitrators specifies otherwise.

ARTICLE 14: FORCE MAJEURE

14.1 SCOPE:

No Member shall be considered to be in default in respect of this Agreement if prevented from fulfilling its obligations due to Force Majeure, as defined in Article 2.17.

14.2 DURATION:

Any Member unable to fulfill an obligation by reason of Force Majeure shall remove such inability within the shortest possible time.

ARTICLE 15: INDEMNITY

Each Member shall defend and indemnify other Members against any claim or liability against them for injury or damage to persons or property including any related loss or expense resulting from the damage caused to other Member's during the construction, commissioning, operation and maintenance of any of the facilities owned, operated and maintained by the indemnifying Member or by act of negligence by other Member(s} employees or agents.

ARTICLE 16: WAIVERS

Waiver at any time by a Member of some or all of its rights with respect to a default or with respect to any other matter arising in connection with this Agreement shall not be deemed a waiver of a Member's rights in any further default by the defaulting Member thereafter.

ARTICLE 17: AMENDMENTS

This Agreement may be reviewed from time to time, but no modification shall be of any force or effect unless reduced to writing and approved by the Operating Members of the Management Committee.

ARTICLE 18: ASSIGNMENT

Each Operating Member shall have the right to assign this Agreement between Operating Members to any successor to all or substantially all of its electric properties, whether by merger, consolidation, sale or otherwise, without the consent of the other Operating Members, provided such successor shall agree in writing to assume ail the obligations of such Operating Member. The Member assigning this Agreement between Operating Members, shall thereupon be released from all liability thereafter arising under this Agreement. This provision shall be applicable to assignees in succession.

ARTICLE 19: NOTICES AND DOMICILIUM

19.1 COMMUNICATION:

Any communication or documents given or sent by any Operating Member to any other Operating Member shall be in writing and shall be deemed to have been duly delivered to the Member to which it is addressed at its respective address, namely:

19.2 DELIVERY TIME:

19.2.1 If a communication is delivered by hand, it shall be deemed to have been received by the addressee on the date of delivery.

19.2.2 If posted by pre-paid registered post, it shall be deemed to have been received by the addressee on the fourteenth (14) day after postage.

19.2.3 If sent by telex, telegram or facsimile, it shall be deemed to have been received by the addressee one (1) day after dispatch.

19.3 CHANGE OF ADDRESS:

Any Member may, by written notice to all of the other Members, change the address to which any notice or request intended for the Member giving such notice shall be addressed.

ARTICLE 20: SIGNATORIES

IN WITNESS whereof the said Operating Members have hereto set their hands:

APPENDIX 1

CHARGES FOR INSUFFICIENT ACCREDITED CAPACITY:

(See also Article 8 of this Agreement)

These charges shall become effective from the commencement date of the SAPP Agreement.

1. ACCREDITED CAPACITY OBLIGATION:

An Operating Member's Accredited Capacity Obligation in any month shall be no less than its Monthly System Peak Obligation forecasted by the Member, plus its Reserve Capacity Obligation based upon the Annual System Peak Obligation.

The Reserve Capacity Obligation of a Member for any month shall be equal to 19 % of the Annual System Peak Obligation of such Member when the generating plant is thermal and 10% when the generating plant is hydro. A weighted average shall apply to Members who have a mixed system.

2. OBLIGATION ENFORCEMENT:

2.1 BEFORE THE FACTS:

The Accredited Capacity Obligation calculations shall be carried out for each of the twelve (12) months starting with the month of April of a year and ending with March of the following year. Input data shall be provided by the Member to the Operating Sub-Committee. The results shall then be circulated among the Operating Members for information.

2.2 AFTER THE FACTS:

At the end of the system peak month the actual Accredited Capacity Obligation shall be calculated by the Operating Sub-Committee based on the actual transactions and the actual Monthly System Peak Demands. Should the calculation indicate a deficit, the Member shall then be subject to the penalty under Item 3.

2.3 DISTRIBUTION OF PENALTIES:

The payment by deficient Members shall be split among Operating Members having a surplus of Accredited Capacity in proportion to each Operating Members contribution to the total excess of Accredited Capacity in the Pool adjusted, if necessary, for Transmission restrictions to the deficient Member.

3. PENALTY RATES:

The penalty shall be based on Service Schedule "L", "Participation Power" and shall be equal to five (5) times the Participation Power Rate specified under Schedule "L", Paragraph 3.1. In January ____ money value it shall be US$_____/kW.

(TABLES 1-3)

APPENDIX 2

SERVICE SCHEDULES

SERVICE SCHEDULE A: EMERGENCY ENERGY

Service Schedule A shall become effective from the commencement date of the SAPP Agreement.

1. EMERGENCY SERVICE:

1.1 Emergency Energy shall mean energy supplied from other Operating Members to an Operating Member who experiences a loss of generation or transmission facilities as the result of an unscheduled outage (or outages) or any cause not reasonably foreseeable. Such energy shall be available for a period of six (6) hours starting from the occurrence of the emergency, after which the Member must obtain other types of services or shed load, should the shortage continue (Article 2.11).

1.2 The energy transfers (purchases and sales) are non-capacity transactions and shall not be credited towards a Member's Accredited Capacity.

2. SERVICE CONDITIONS:

2.1 The provision of Emergency Energy shall be up to the full amount of the Operating Member's available Accredited Capacity, but only if the Operating Member which experiences an Emergency Situation complies with its Accredited Capacity Obligation.

2.2 Any Member, if so requested, shall supply Emergency Energy unless the supply of Emergency Energy will overload or endanger its own system or the performance of its contractual obligations to others. Specifically, supplies of Emergency Energy shall not interfere with any service provided on a firm basis. However, an Operating Member who is simultaneously selling non-firm energy or any "comparable" service to another Member shall, if necessary, interrupt these non-firm services in order to supply Emergency Energy.

2.3 A Member which is selling non-firm energy or any comparable service to another system, shall not be eligible to receive Emergency Energy unless such service is interrupted, following the emergence of an Emergency Situation.

2.4 If the supplying and receiving Members are not directly interconnected, Wheeling shall take place in accordance with Service Schedule I and shall be firm.

2.5 Emergency Energy shall be converted as soon as possible into another type of transaction in accordance with the procedures specified in the Operating Guidelines. After six (6) hours there shall no longer be an obligation by the other Operating Members to continue the supply of Emergency Energy and the Member receiving this service shall then resort to load shedding if necessary.

2.6 Emergency Energy shall be purchased and sold at the Points of Interconnection.

3. RATES FOR EMERGENCY ENERGY:

3.1 Unless otherwise agreed between the Members, Emergency Energy shall be charged at a rate which is the greater of 150% of the total costs of owning and operating a new coal-fired station or 115 % of the Seller's Short Run Marginal Cost of Generation, in January ___ money value, the rate shall be at least equal to US$ _____/MWh; this rate shall be reviewed annually by the Planning Sub-Committee.

3.2 If, in a year, the Planning Sub-Committee fails to review the Dollar rate as per Item 3.1 above and if the Parties do not agree otherwise, the Dollar rate for Emergency Energy in Financial Year "n+ 1 " shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index as issued by the Department of Commerce of the Federal Government of the United States of America for October of Year "n" divided by that of October of Year "n-l".

3.3 The supplier of Emergency Energy may, at his discretion, require the purchaser to return such energy at such times and under such conditions that the supplying Member will not experience a loss due to the transaction, or under conditions mutually agreeable to both Members.

3.4 Wheeling charges, if any, shall be to the account of the receiving Member and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE B: SYSTEM ENERGY

Service Schedule B shall become effective from the commencement date of the SAPP Agreement.

1. SYSTEM ENERGY:

1.1 System Energy hall mean energy purchased by one Operating Member from another Operating Member to defer the use of fuel or water, to reduce transmission losses, to improve environmental conditions or for any other reasons of a similar nature (Article 2.42).

1.2 The energy transfers (purchases and sales) are non-capacity transactions and shall not be credited towards Accredited Capacity.

2. SERVICE CONDITIONS:

2.1 Operating Members are qualified to purchase System Energy only to the extent that they have alternate and defined dependable capacity, including purchased capacity that could otherwise be started up and used.

2.2 The notice to be given for the interruption of System Energy shall influence the rates at which the transaction takes place.

2.3 No System Energy transaction, even when the ultimate purchaser is not an Operating Member of the SAPP, can conflict or Interfere with the purchase or sale of Emergency Energy and any System Energy shall be discontinued if necessary, to prevent such conflict or interference from occurring.

2.4 The Members shall mutually agree on the following.

(a) The amount of such System Energy that the buyer desires to purchase and which can be delivered by the Seller;

(b) The selling price of such System Energy;

(c) The schedule for delivery of such energy;

(d) The notice of interruption, which shall typically be one (1) hour; eight (8) hours; sixteen (16) hours or twenty-four (24) hours.

(e) Any other pertinent factor.

2.5 The Seller may furnish at the agreed selling price the requested System Energy from any available source it chooses, including purchases from non-Members for resale to the Buyer.

2.6 If the Seller's and Buyer's systems are not directly interconnected, Wheeling shall take place in accordance with Schedule I and the wheeling contract shall be of the same duration as the main contract.

2.7 The Wheeling required for such a service may be non-firm.

2.8 System Energy shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3. RATES FOR SYSTEM ENERGY:

3.1 If the selling Member increases generation at thermal units or if the selling Member is importing System Energy and re-selling it, the rate shall be a function of the Seller's Short Run Marginal Cost of Generation (SRMC) and of the notice to be given before an interruption.

Unless otherwise agreed between the Parties, the rates shall not exceed:

120% of the Seller's SRMC if the notice is one (1) hour;
125% of the Seller's SRMC if the notice is eight (8) hours;
130% of the Seller's SRMC if the notice is sixteen (16) hours;
135% of the Seller's SRMC if the notice is twenty-four {24) hours.

3.2 If the selling Member increases generation at hydro units and if the Buyer reduces its generation at thermal units, the rate shall be a function of the Buyer's Short Run Marginal Cost of Generation (SRMC) and of the notice to be given before an interruption.

Unless otherwise agreed between the Parties, the rates shall not exceed:

85% of the Buyer's SRMC if the notice is one {1) hour;
88 % of the Buyer's SRMC if the notice is eight (8) hours;
92% of the Buyer's SRMC if the notice is sixteen (16) hours;
95% of the Buyer's SRMC if the notice is twenty-four {24) hours.

3.3 If the selling Member increases generation at hydro units and if the Buyer reduces generation also at hydro units, the selling price of System Energy shall be determined by mutual consent.

3.4 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE C: ECONOMY ENERGY

Service Schedule C shall become effective from the commencement date of the SAPP Agreement.

1. ECONOMY ENERGY:

1.1 Economy Energy shall mean energy produced at thermal power station(s) that one Operating Member purchases from another operating Member to replace higher cost energy by lower cost energy. The savings resulting from such a transaction shall be split between the purchasing and the selling Members.

1.2 Economy Energy purchases and sales are non-capacity, non-firm transactions. They do not include a demand or capacity charge and shall not be included in the calculation of Accredited Capacity.

2. SERVICE CONDITIONS:

2.1 Economy Energy may be interrupted at any time after notification at the sole discretion of the Seller.

2.2 An Operating Member may purchase Economy Energy only to the extent that such a Member has alternative capacity that is synchronized either in its own system or through contract in another system that could otherwise be used.

2.3 No Economy Energy transaction will conflict or interfere with the purchase or sale of Emergency Energy and any transfer of Economy Energy shall be curtailed or discontinued, if necessary, to prevent conflict or interference.

2.4 If the supplying and receiving Members are not directly interconnected, Wheeling shall take place in accordance with Schedule I, and the wheeling contract shall be of the same duration as the main contract. The transmission required for such a service may be non-firm.

2.5 Economy Energy shall be purchased and sold at the Points of interconnection and the transactions shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3. RATES FOR ECONOMY ENERGY:

3.1 The overall savings per MWh are equal to the difference between the Short Run Marginal Costs of Generation (SRMC) of the Seller and the Buyer. The billing rate shall be equal to one half of the overall savings per MWh added to the Short Run Marginal Cost of Generation of the Seiler, unless otherwise agreed.

3.2 If the Purchasing Member reduces its own hydro generation and if the selling Member increases its own thermal generation or imports Economy Energy for re-sale, the charge shall not exceed 115 % of the Sellers Short Run Marginal Cost of Generation unless otherwise agreed.

3.3 Wheeling charges, if any, shall be to the account of the Buyer and comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE D: SURPLUS ENERGY

Service Schedule D shall become effective from the commencement date of the SAPP Agreement.

1. SURPLUS ENERGY:

1.1 Surplus Energy shall be energy from hydro power station(s) that one Operating Member purchases from another Operating Member to replace higher cost (or higher replacement cost) energy and which enables the purchasing and selling Members to share the savings through more efficient use of resources.

1.2 The energy transfers (purchases and sales) are non-capacity non-firm transactions and shall not be included in Accredited Capacity calculations.

2. SERVICE CONDITIONS:

2.1 An Operating Member may purchase Surplus Energy only to the extent that such a Member has alternative capacity that is synchronized either in its own system or through contract in another system that could otherwise be used.

2.2 No Surplus Energy transaction will conflict or interfere with the purchase or sale of Emergency Energy and any transfer of Surplus Energy shall be curtailed or discontinued if necessary, to prevent such conflict or interference.

2.3 If the supplying and receiving Members are not directly interconnected Wheeling shall take place in accordance with Schedule I and the Wheeling Contract shall be of the same duration as the main contract. The transmission required for such a service may be non-firm.

2.4 Surplus Energy shall be purchased and sold at the Points of Interconnection and the transactions shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected system.

2.5 Surplus Energy may be interrupted at any time after notification. at the sole discretion of the Seller.

3. RATES FOR SURPLUS ENERGY:

3.1 When the Selling Member increases its generation at hydro units and the Buyer reduces its generation at thermal units, the rate shall not exceed 75 % of the Buyer's Short Run Marginal Cost of Generation unless otherwise agreed by the Parties.

3.2 When the Selling Member increases generation at hydro units and the Buyer reduces generation also at hydro units, the selling price of Surplus Energy shall be determined by mutual consent.

3.3 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Schedule I.

SERVICE SCHEDULE E: ENERGY BANKING

Service Schedule E shall become effective from the commencement date of the SAPP Agreement.

1. ENERGY BANKING:

1.1 This schedule provides for interchange of energy between Members. Energy Banking shall mean energy which a Member desires to sell from its own system that is in excess of its commitments and which the other Member desires to purchase to improve its electrical system operation. Energy Banking may include energy interchange for the purpose of pond storage control or to facilitate banking of thermal energy. Energy Banking may also include an agreement for the interchange of energy on a daily or weekly basis.

1.2 The Energy transfers (banking, purchases and sales) are non-capacity, non-firm transactions and shall not be credited towards Accredited Capacity.

2. SERVICE CONDITIONS:

2.1 The Members shall agree on the following:

- The period the transaction is effective;
- The scheduling of energy;
- The price of the transaction;
- That the exchange may provide for the return of equivalent energy;
- Other pertinent factors.

2.2 If the two Members are not directly interconnected, Wheeling may take place in accordance with Schedule I, and the wheeling contract shall be of the same duration as the main contract.

2.3 Wheeling may be non-firm.

2.4 Banking Energy shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

3. RATES FOR ENERGY BANKING:

3.1 The rates and terms for Energy Banking shall be negotiated by the Members and may include the return of equivalent energy.

3.2 The savings resulting from an Energy Banking transaction that includes an agreed exchange of energy on a daily or weekly basis between the thermal units of a Member and the hydro units of another Member, shall be shared equally between the Parties Such savings shall be the difference between the "value of energy" and the "cost of energy" after Wheeling, transmission losses and spillage have been taken into account. In particular:

3.2.1 Unless otherwise agreed, the "cost of energy" shall be the thermal unit's Short Run Marginal Cost of Generation for energy delivered to the hydro system and the "value of energy" shall be the thermal unit's Short Run Marginal Cost of Generation when energy is delivered back to the thermal system.

3.2.2 Spillage shall be that energy lost if the hydro system must spill water from its reservoirs during the period that energy is stored in the hydro system. The quantities of energy lost in this manner shall be deducted from the energy to be returned to the thermal system.

3.3 Unless otherwise agreed, the following shall apply where the interval between the deposit and withdrawal of energy is more than one (1) week:

3.3.1 If the Depositor is the requesting Party it shall be credited for each deposit it makes with an amount equal to the energy deposited multiplied by the "cost of energy" in 3.2.1 less a negotiated margin not exceeding 20 %. Where both the Depositor and Banker have hydro systems the rate for deposited energy shall be by mutual consent.

3.3.2 If the Banker is the requesting Party, the Depositor shall be credited for each deposit it makes with an amount equal to the energy deposited multiplied by the cost of energy in 3.2.1 plus a negotiated margin not exceeding 20 %. Where both the Depositor and Banker have hydro systems, the rate for deposited energy shall be by mutual consent.

3.3.3 The Depositor Member may withdraw energy from its account from time to time at a rate not exceeding that specified in advance until the account is depleted. The value of the energy withdrawn at any time will be the amount of energy multiplied by the "value of energy" in 3.2, or that agreed by mutual consent if both the Depositor and the Banker have hydro systems.

3.3.4 The requesting Party shall pay for the wheeling charges, if any. The Purchaser of banked energy (whether the Depositor or another Member), will pay the wheeling charges if any, when energy withdrawal takes place. Wheeling shall comply with the provisions of Article 11.3.3 and of Schedule I.

SERVICE SCHEDULE. F: SHORT-TERM FIRM POWER

Service Schedule F shall became effective from the commencement date of the SAPP Agreement.

1. SHORT-TERM FIRM POWER:

1.1 Short-Term Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction.

1.2 Such power shall include the required reserve capacity.

2. SERVICE CONDITIONS:

2.1 This Schedule shall be available for the sale of Short-Term Firm Power for periods of seven (7) or more consecutive days and shall not exceed a period of six (6) consecutive months.

2.2 Short-Term Firm Power shall be included in the Monthly System Peak Obligation of a Member only when a special condition applies, such as:

2.2.1 when a significant new industrial customer's load is imposed upon a Member's system at a time different from the purchase period for which other schedules are applicable: or

2.2.2 when a generator or transmission line addition does not meet the scheduled in-service date; or

2.2.3 when it is being purchased for resale to a party that is not a Member.

2.3 Wheeling for this type of transaction shall be firm and the duration of the wheeling contract shall be the same as that of the main transaction.

3. RATES FOR SHORT-TERM POWER:

3.1 The receiving Member shall pay to the supplying Member for Short-Term Firm Power supplied during any month. a capacity rate of US$ ___/kW per week in January ___ money values, unless otherwise agreed. This rate shall be reviewed yearly by the Planning Sub-Committee.

3.2 Unless otherwise agreed, if the sale is from a predominantly thermal system, the energy charge shall not exceed 115 % of the Seller's Short Run Marginal Cost of Generation.

3.3 If a hydro system sells Short-Term Firm Power to a thermal system, the energy charge shall not exceed 80 % of the Buyer's Short Run Marginal Cost of Generation, unless the Parties have agreed on other terms.

3.4 When a hydro system sells Short-Term Firm Power to another hydro system, the energy rate shall be determined by mutual consent.

3.5 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and of Schedule I.

3.6 If, in a year, the Planning Sub-Committee fails to review the rate as per Item 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year "n+ 1 " shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-1 ".

SERVICE SCHEDULE G: SYSTEM PARTICIPATION POWER

Service Schedule G shall become effective from the commencement date of the SAPP Agreement.

1. SYSTEM PARTICIPATION POWER:

1.1 System Participation Power provides for the sale of Firm Capacity and Energy by a Member to another Member for a specified period, not exceeding a six (6) month period.

1.2 The Member purchasing the capacity shall be required to provide the reserve.

2. SERVICE CONDITIONS:

2. 1 This Schedule shall be available for the sale of System Participation Power for periods of seven (7) or more consecutive days.

2.2 System Participation Power is intended to be available at all times during the period covered by the commitment. However, should problems occur, the Seller's Firm Power sales and services to its own customers shall have priority if the transaction is for less than six consecutive months, in which case the supplying Member shall have the right to notify the Buyer to reduce its schedule, which shall be promptly complied with until such problems have been rectified.

2.3 System Participation Power shall be included in the Accredited Capacity only when a special condition applies, such as:

2.3.1 when the purchase is for resale to a party which is not a Member; or

2.3.2 when a Member purchases System Participation Power for a period of six (6) consecutive months.

2.4 System Participation Power shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

2.5 Wheeling for this type of transaction shall be firm and the duration of the wheeling contract shall be the same as that of the main transaction.

3. RATES FOR PARTICIPATION POWER:

3.1 The rate for capacity shall be equal to US$____/kW /day in January ___ money values, unless otherwise agreed. This rate shall be reviewed annually by the Planning Sub-Committee.

3.2 Unless otherwise agreed, if the sale is from a system that is predominantly thermal, the energy rate shall not exceed 115 % of the Seller's Short Run Marginal Cost of Generation.

3.3 If System Participation Power is obtained from a hydro unit and sold to a thermal system, the energy rate shall not exceed 80 % of the Buyer's Short Run Marginal Cost of Generation, unless otherwise agreed.

3.4 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

3.5 If, in a year, the Planning Sub-Committee fails to review the rate in Item 3.1 above and if the Parties do not otherwise agree, the rate in financial Year "n+ 1" shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year"n-1".

SERVICE SCHEDULE H: OPERATING RESERVE

Service Schedule H shall become effective from the commencement date of the SAPP Agreement.

1. OPERATING RESERVE SERVICE:

1.1 Operating Reserve under this Service Schedule shall mean unused capacity above System Demand that is required only to cater for Unplanned Outages (Article 2.44).

1.2 An Operating Member may purchase Operating Reserve from another Operating Member as part or all of its Operating Reserve Obligation.

1.3 Operating Reserves purchased under this Service Schedule shall not be credited towards the Accredited Capacity of the receiving Member.

2. SERVICE CONDITIONS:

2.1 The Operating Reserve shall be capacity made available as scheduled unless, in the opinion of the supplying party, it is prevented or made inadvisable due to an Emergency Situation or another unforeseen condition.

2.2 The energy flows resulting from the Operating Reserve contracted for must be available within the time prescribed in the Operating Guidelines. As soon as Operating Reserve is taken up by the receiving Member who then starts to also receive energy, the transaction shall be converted into System Energy (Schedule B).

2.3 Unless otherwise agreed, the portion of Spinning Reserve and Quick Reserve making up the Operating Reserve purchased under this type of transaction shall be as specified in the Operating Guidelines.

2.4 Operating Reserve shall be converted into System Energy interruptible at a one (1) hour notice rate, unless otherwise agreed. This shall be for less than ten (10) occurrences in any calendar month. Energy deliveries beyond these limits shall be treated as Short-Term Firm Power.

2.5 The Wheeling required for such services may be non-firm. The wheeling contract shall be of the same duration as the main contract.

2.6 Operating Reserve shall be purchased and sold at the Points of Interconnection.

2.7 Operating Reserve transactions shall always be for complete days.

3. RATES FOR OPERATING RESERVE:

3.1 Unless otherwise agreed by the parties, the rate for "Operating Reserve" shall be 20 % of the total fixed costs per kW of owning and operating a large coal-fired station. In January ___ money value, the rate shall be US$____/MW per day. This rate shall be reviewed every year by the Planning Sub-Committee.

3.2 The Energy Rate shall be as per Item 2.4 above.

3.3 With short-term contracts lone month or less), the receiving Member may cancel all or part of a scheduled transaction with a minimum notice of twenty-four (24) hours and the cancellation fee shall be equal to the price to pay if the arrangement had continued for another twenty-four (24) hours.

3.4 If the Selling Member is unable to provide all or a portion of the required energy within the time specified in the Operating Guidelines, it shall not be entitled to the payment corresponding to the shortfall over a period of twenty-four (24) hours.

3.5 Wheeling charges shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

3.6 If, in a year, the Planning Sub-Committee fails to review the rate in Item 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year "n+ 1 " shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-l".

SERVICE SCHEDULE I: WHEELING

Service Schedule I shall become effective from the commencement date of the SAPP Agreement.

1. WHEELING:

Wheeling shall mean transmitting a contractual amount of power over specified time periods through the system of an Operating Member who is neither the Seller nor the Buyer of this power {Article 2.45).

2. SERVICE CONDITIONS:

2.1 Firm Wheeling: The Operating Member' whose assets are engaged in Wheeling guarantees that the wheeled power will enjoy the same priority as any firm supply to its own customers. It should be able to provide such service for various conditions as specified in the Operating Guidelines.

2.2 Non-Firm Wheeling: The Operating Member whose assets are engaged in non-firm Wheeling may curtail or interrupt the flow of wheeled power based on technical and economic considerations for its system without any penalty.

2.3 Whenever the service is interrupted, the Buyer has the right to request justification of any curtailment or interruption. This information may be submitted to the Operating Sub-Committee for comments.

2.4 A wheeling transaction in which the transmission facilities of more than one Operating Member are involved, shall be categorized as non-firm if at least one Operating Member does not guarantee a firm wheeling transaction and more than 10 % of the total scheduled transaction goes through that system.

2.5 For any Wheeling arranged under this Agreement, the required transmission capacity of the wheeling Member shall be reserved for the same time period as the main transaction. For deals longer than three (3) months the reservation of transmission capacity shall be contained in a written agreement between the purchasing Member, and the wheeling Member.

2.6 Firm Wheeling shall always be applicable to Emergency Energy. Firm Power and Participation Power (Service Schedules A, F, K, G and L).

2.7 The capability to provide specific wheeling services and the determination of the charges for each transaction shall be determined in chronological order in which the wheeling contracts are signed.

2.8 Unless otherwise agreed between the parties, reservation of transmission facilities for wheeling purposes shall be a "take or pay" transaction or alternatively, the notice for cancellation shall be at least three (3) months.

2.9 If, due to load growth in excess of the forecast submitted to the Planning Sub-Committee, a wheeling transaction becomes detrimental to an Operating Member's obligations towards its own customers, then such a situation shall be brought to the attention of the other parties and shall constitute sufficient ground for the renegotiation of the wheeling arrangement, unless specified to the contrary in the wheeling transactions covering a period longer than three (3) years.

2.10 Wheeling shall cover the full distance between Points of Interconnection.

3. COSTS RECOVERED IN THE WHEELING CHARGE

3.1. The monies to be recovered by the wheeling Member shall include the following:

3.1.1 Rent of Assets: This charge shall be derived from the levelized capital costs of the transmission facilities used for Wheeling, in proportion to the use made of such facilities to implement the wheeling transaction.

3.1.2 Where applicable for long-term deals, the opportunity cost of foregone benefits as a direct consequence of the wheeling transaction must be taken into account. Conditions necessary to claim opportunity costs are as follows:

3.1.2.1 Demonstrate the financial loss of the wheeler due to a firm transaction replacing Firm Sale that the wheeler could otherwise have made.

3.1.2.2 Prove the loss of opportunity of connecting new large customers.

3.1.2.3 Prove foregone potential contributions to existing system costs by other potential transactions.

3.1.2.4 Prove foregone savings in distribution costs, should cheaper energy be accessible from elsewhere.

3.2 Unless otherwise agreed between the parties, the extra transmission losses (positive or negative) in the wheeler's system shall be compensated by extra generation by the Seller of energy as specified in Article 11 .3.3.

3.3 If the wheeling transaction is firm, full rent of transmission assets is to be recovered, but if the wheeling transaction is non-firm, only 50 % of the rent is to be recovered. Unless the wheeling transaction extends over more than three (3) years, Operating Members shall not be allowed to include in wheeling charges any other cost than those given in 3.1 above.

4. ASSETS INVOLVED IN WHEELING

An Operating Member making use of transmission facilities belonging to another Member for the purpose of Wheeling shall pay a rent for the assets used in accordance with the procedures determined by the Planning Sub-Committee. These procedures shall use the following guidelines:

4.1 Calculate the transmission losses caused by the wheeling transaction by comparing load flow studies with and without Wheeling. The Increase (saving) in losses shall be supplied by the Seller of energy and purchased by the Buyer in accordance with Article 11.3.3. If several wheeling transactions occur at the same time, they will be classified into firm and non-firm transactions and the magnitude of the losses will be determined considering first the chronological order in which the firm wheeling transactions were agreed upon (last signature) and thereafter the chronological order in which the non-firm wheeling transactions were agreed upon (last signature).

4.2 Identify the cost of the assets used in the wheeling transaction. These shall either be transmission lines plus their feeder bays (at either end) or coupling transformers plus their switch bays on either side. Common equipment such as bus couplers, bus sections, reactors, capacitors, SVCs etc. and their switching equipment as well as control rooms shall be ignored when calculating the rent of assets in a wheeling transaction.

4.3 Determine the proportional usage of transmission assets for wheeling purposes by conducting load flow studies and assuming that plant is fully loaded {utilized) either at its name plate rating {switch gear, transformers, etc.) or at the limits stipulated by the Planning Sub-Committee (transmission lines). System conditions may be modeled hourly post factum on the

basis of metered data; alternatively, typical system conditions and their duration as agreed upon between the Purchaser and the Seller of wheeling services are modeled ante factum.

4.4 Calculate the rent payable for the usage of assets engaged in Wheeling. This rent shall be based on the replacement costs of the assets updated from time to time by the Planning Sub-Committee, an economic life of twenty-five (25) years and a net discount rate not exceeding _ %. Until reviewed by the Planning Sub-Committee, the net discount rate shall be _ %. The annual operation and maintenance costs on the facilities engaged in Wheeling shall be 2 % of the replacement costs of these assets and shall be added to the rent value of the assets.

5. RENT OF TRANSMISSION FACILITIES:

5.1 FORMULA:

The rent formula shall be as follows:

R = r divided by [l - (l + r)n]

where: r is the net discount rate
n is the economic life of the asset
R is the rent per annum for an asset worth US$l.00

If the net discount rate or required return on investment "r" (in constant money values) is 4 % and the economic life is twenty-five (25) years, R = 6.40% per annum.

R = 0.04 divided by [1 – 1.04-25] = 4% x 1,6003 = 6.40 %

For non-firm Wheeling, half of this value shall apply.

5.2 COSTS COVERED BY THE RENT FORMULA:

The difference between "R" and the net discount rate "I" covers the generation of funds for the replacement of the plant at the end of its life. In other words, the rent formula provides the wheeler with the means of replacing its assets after twenty-five (25) years plus, in this example, a real return on assets equal to 4 %. The return on asset for this type of plant should be lower than for generating plant because the financial risk of building new transmission facilities is also less.

For simplification purposes, a relatively low return on the un-depreciated value of the assets has been assumed rather than taking a higher return on assets which have already been depreciated over a number of years.

5.3 IMPLEMENTATION:

Bearing in mind that system conditions change in time, so does the proportional utilization of the assets engaged in wheeling. In principle, the calculation should be repeated each time a change in system conditions occurs; alternatively, typical system conditions and their duration are agreed before the facts.

Where power exchanges are monitored on an hourly basis. it is appropriate to calculate the hourly wheeling charge for each hour. The hourly rent for using an asset in full, can be taken as:

Hourly rent = Annual rent divided by 8760

5.4 STANDARD COSTS OF TRANSMISSION FACILITIES:

Until reviewed by the Planning Sub-Committee, the value of the transmission assets used in wheeling shall be established using the standard replacement costs given in Tables 1, 2 and 3 below. These costs are valid in the ____ - ____ Financial Year. Costs in Financial Year "n+ 1 " shall be equal to the costs in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year"n-1".

SERVICE SCHEDULE 1: WHEELING

TABLE 1: TRANSMISSION LINE REPLACEMENT COSTS
FINANCIAL YEAR ____ - _____

ITEM OF PLANT	COND. (SQ. MM)	REPLACEMENT COSTS (US$10³/km)
1.		
2.		

SERVICE SCHEDULE 1: WHEELING

TABLE 2: SWITCH BAY REPLACEMENT COSTS (INCLUDING PROTECTION, CARRIERS AND MEASUREMENTS, CIVIL WORKS AND CABLING)
FINANCIAL YEAR ____ - _____

Kv	ITEM OF PLANT	AMPS FAULT (KA)	REPLACEMENT COSTS (US$10³/km)
1.			
2.			

SERVICE SCHEDULE 1: WHEELING

TABLE 3: TRANSFORMER REPLACEMENT COSTS (INCLUDING PROTECTION, MEASUREMENTS, CIVIL WORKS, CABLING, Etc.)
FINANCIAL YEAR ____ - _____

VOLTAGE HV SIDE	LV SIDE	RATING (MVA)	REPLACEMENT COSTS (US$10³/km)
1.			
2.			

SERVICE SCHEDULE J: SCHEDULED OUTAGE ENERGY

Service Schedule J shall become effective from the commencement date of the SAPP Agreement.

1. SCHEDULED OUTAGE ENERGY:

1.1 This Schedule provides for the supply of energy from a Member to any other Member during Scheduled Outages for maintenance of generating or transmission facilities or both.

1.2 The capacity transfers resulting from Scheduled Outage flows shall not be credited to the Accredited Capacity of the receiving Member.

2.2 SERVICE CONDITIONS:

2.1 Scheduled Outage Energy is only to be purchased against Accredited Capacity out of service for maintenance or when that capacity is limited due to maintenance.

2.2 If the Seller suffers a loss of generation, but can still meet its firm load commitments, the Scheduled Outage Energy must continue unless the Buyer agrees to a reduction or termination.

2.3 A Member shall sell Scheduled Outage Energy to a requesting Member only when this Member has fully utilized its available Accredited Capacity to meet its load commitments and Operating Reserve obligations.

2.4 Scheduled Outage Energy may be scheduled from a Member not directly interconnected, provided such energy is available at a lower delivered cost, including Wheeling. Wheeling for this type of transaction shall be firm.

2.5 Scheduled Outage Energy shall be purchased and sold at the Points of Interconnection and the transaction should not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

2.6 Wheeling may be non-firm.

3. RATES FOR SCHEDULED OUTAGE ENERGY:

3.1 Unless otherwise agreed, the Buyer shall pay to the Seller the greater of:

(a) 115% of the Average Production Cost incurred by the Seller to produce such energy, or;

(b) 115% of the Average Production Cost incurred by the Buyer if the Buyer had produced such energy with the generating unit that is out of service.

3.2 Under 2.3, the Seller may require an additional payment for any financial loss that accrues to the Seller due to this transaction replacing a sale to another Party.

3.3 The Seller may require the Buyer to return such energy at times and under conditions that the Seller will not experience a loss due to the transaction, or under conditions acceptable to both Parties.

3.4 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

SERVICE SCHEDULE: FIRM :POWER

Service Schedule K shall become effective from the commencement date of the SAPP Agreement.

1. FIRM POWER:

1.1 Firm Power shall mean contracted capacity and associated energy intended to be available at all scheduled times for the duration of the transaction.

1.2 Firm Power shall include the necessary Reserve Capacity.

1.3 Firm Power purchases shall be credited to the Monthly System Peak Obligation of the receiving Member; Firm Power sales shall be debited against the Monthly System Peak Obligation of the supplying Member.

2. SERVICE CONDITIONS:

2.1 Any transaction under this Schedule shall cover a period of six (6) months or longer.

2.2 Firm Power can be base, intermediate or peaking power; it can be continuous or Intermittent, as specified in the particular contracts.

2.3 Adequate provision shall be made for transmitting the energy and, when Wheeling through the system of another Operating Member is required, the Wheeling shall be firm.

2.4 When Wheeling is required, the provisions under Service Schedule I shall apply. The duration of the Wheeling arrangement shall be the same as that of the main transaction.

2.5 Firm Capacity shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the inteconnected systems.

3. RATES FOR FIRM POWER:

3.1 The recommended capacity rate for Firm Power shall be 115 % of the total fixed costs of owning and operating a new coal-fired power station and shall be reviewed every year by the Planning Sub-Committee, taking into account new capacity either commissioned, under construction or planned in the Region. In January ____ money values, the rate shall be US$___/kW per month, unless otherwise agreed between the Parties. The terms for Firm Power shall be negotiated by the Members for each transaction.

3.2 If dedicated transmission lines must be built to transport the Firm Power to the Buyer's system, a rent of transmission facilities as calculated in Schedule I on Wheeling, shall be levied upon the Buyer.

3.3 If the sale is from a predominantly thermal system, the energy rate shall not exceed 115 % of the Seller's Short Run Marginal Cost of Generation unless the Parties have agreed on other terms.

3.4 If a hydro system sells Firm Power to a predominantly thermal system, the energy charge shall not exceed 80 % of the Buyer's Short Run Marginal Cost of Generation unless the Parties have agreed on other terms.

3.5 When a hydro system sells Firm Power to another hydro system, the energy charge shall be determined by mutual consent.

3.6 The wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and of Schedule I.

3.7 The degree of firmness, the penalties and the amount of load shedding, if any, that must occur in the Seller's system before Firm Power may be curtailed or interrupted, must be clearly specified in the agreement covering the transaction and may command a premium.

3.8 If, in a year, the Planning Sub-Committee fails to review the rate as per 3.1 above and if the Parties do not otherwise agree, the rate in Financial Year "n+ 1 " shall be equal to the rate in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n - l".

SERVICE SCHEDULE L: PARTICIPATION POWER

Service Schedule L shall become effective from the commencement date of the SAPP Agreement.

1. PARTICIPATION POWER:

1.1 Participation Power shall mean the lease of a specific generating unit (or units) or a portion of such unit(s) and the sale of its production from one Operating Member to another Operating Member. This capacity and energy shall be continuously available except when such unit (or units) is out or service for maintenance or repair during which time the delivery of energy from other sources shall be at the Seller's discretion (see Article 2.26).

1.2 The Member purchasing the capacity shall be required to provide the reserve.

1.3 Participation Power shall be credited towards the" Accredited Capacity" of the receiving Member and debited against the "Accredited Capacity" of the supplying Member.

2. SERVICE CONDITIONS:

2.1 This Schedule shall be available for the sale of Participation Power for a period of six (6) months or more.

2.2 Participation Power shall be purchased and sold at the Points of Interconnection and the transaction shall not be scheduled in amounts that overload any transmission facility or endanger the operation of the interconnected systems.

2.3 Wheeling for this type of transaction shall be firm.

3. RATES FOR PARTICIPATION POWER:

3.1 The terms for Participation Power shall be negotiated by the Members for each transaction. Unless otherwise agreed, the capacity rate shall not exceed the fixed costs per kW of owning and , operating a large coal-fired station. In January ____ money value, this cost equals US$____/kW per month. The rate shall be reviewed by the Planning Sub-Committee every year.

3.2 In the event that services cannot be supplied on the effective date of an Agreement due to a delayed in-service date, the capacity rate to be paid by the purchasing Member shall not become effective until the date such facilities are certified as Accredited Capacity.

3.3 Unless otherwise agreed. if the Seller has a system that is predominantly thermal, the energy rate shall not exceed 115 % of the Seller's Short Run Marginal Cost of Generation.

3.4 If Participation Power is obtained from a hydro unit and sold to a thermal system, the energy rate shall not exceed 80% of the Buyer's Short Run Marginal Cost of Generation. unless otherwise agreed.

3.5 Wheeling charges, if any, shall be to the account of the Buyer and shall comply with the provisions of Article 11.3.3 and Service Schedule I.

3.6 If, in a year, the Planning Sub-Committee fails to review the rates as per 3.1 above and if the Parties do not otherwise agree, the rates in Financial Year "n+ 1" shall be equal to the charges in Financial Year "n" multiplied by the ratio between the Production Price Index in the United States in October of Year "n" divided by that in October of Year "n-l".

SERVICE SCHEDULE M: CONTROL AREA SERVICES

Service Schedule M shall become effective from the commencement date of the SAPP Agreement.

1. CONTROL AREA SERVICES:

Control Area Services is a contract one Operating Member (Member A) has with another Operating Member (Member B) to be part of its Control Area (Control Area of Member B). This Schedule is available to the Operating Members who have difficulty in meeting the control criteria as specified in the Operating Guidelines.

2. SERVICE CONDITIONS:

2.1 A Member may purchase Control Area Services only from an Operating Member or non Pool Member to which it is directly connected.

2.2 Any transaction under this Schedule shall cover a period of at least three (3) months.

2.3 The energy flows resulting from this type to transaction shall be calculated as specified under 2.4 below and shall be returned in kind or contracted for separately, for exam pie in the same way as for energy flows resulting from Operating Reserve Services.

2.4 The hourly energy flows shall be equal to:

(i) the sum of all the actual energy flows in a clock hour through the Points of Interconnection linking Member A to all other Members, where exports are positive and imports are negative;

(ii) minus the sum of all the scheduled energy flows in the same clock hour through the Points of interconnection linking Member A to all other Members, where exports are positive and imports are negative; A negative value means that Member A shall return energy to other Members.

3. AMOUNT OF CAPACITY REGULATED:

The amount of capacity regulated by Member B on behalf of Member A in an hour shall be equal to the sum of:

(i) the largest difference in that clock hour between the (actual) instantaneous power exports and the scheduled power flows at the same moment, and

(ii) the largest difference in the same clock hour between the (actual) instantaneous power imports and the scheduled power flows at the same moment.

4. RATES:

Unless otherwise agreed between the Parties, the rates for Control Area Services shall be the same as for Operating Reserve (item 3.1. Schedule H) and shall apply to the amount of capacity regulated as specified in Item 3 above.

APPENDIX 3

CALCULATION OF ENERGY AND CAPACITY RATES

1.1 INPUT DATA:

We assume as a benchmark. a new coal-fired power station, dry-cooled and equipped with six (6) units developing 635 MW-SO each.

In January ____ (US$/___ exchange rate of Rs. ____/US$), the cost per kW, after adjustment for construction time, is about $____/kW (no $S0^2$ nor Nox removal) and the fixed operation and maintenance (O & M} costs, once the station is fully commissioned, are about $____ million per month. The variable O & M costs are $0.__/MWh-SO.

The fuel costs are assumed to be proportional to the energy sent out and are equal to $____ /ton or $_____/MWh (33 % efficiency; __ GJ/ton). The average load factor is in the vicinity of 65 %; the energy produced every month is thus ____ GWh (___hours in a month).

1.2 LEVELIZED COST OF CAPITAL AND FIXED O & M COSTS:

Assuming an economic life of thirty (30) years and a net discount rate of 6 %, the levelized cost of capital or the rent value of the capital invested in the plant is $____ /kW per month:

R = r divided by [1 - (1 + r)-n] = 0.06+ (1-1.06-30) = 7.26%

$1010/kW x 7.26% divided by 12 = $6.11/kW per month

With a 65 % load factor, the levelized cost of capital is also equal to $12.88/MWh:

$6110/MW + (730h x 65 %) = $12.88/MWh

The fixed O & M casts are $4.25 million per month or $1.12/kW per month, or $2.36/MWh:

$4.25 million + (6 x 635 MW) = $1.12/kW per month
$1120/MW divided by (730h x 65 %) = $2.36/MWh

1.3 TOTAL FIXED COSTS (JANUARY ____):

The total fixed costs are therefore $7.23/kW per month:

$6.11/kW divided by $1.12/kW = $7.23/kW per month.

Expressed in energy terms, the total fixed costs are equal to US$15.24/MWh:

$12.88/MWh divided by $2.36/MWh = $15.24/MWh

1.4 VARIABLE COSTS (JANUARY ____):

With a load factor of 65 %, the energy delivered by the station is 1,808 GWh per month and the variable O & M plus fuel costs are $6.04/MWh, or $10,92 million per month, or $2.86/kW per month:

6 x 635 MW x 8760h x 0.65 divided by 12 = 1808 GWh per month
$5.51/MWh divided by $0.53/MWh = $6.04/MWh
$6040/GWh x 1,808 GWh = $10.92 million per month
$6.04/MWh x 730 hours x 65% = $2,866/MW per month

1.5 TOTAL ENERGY COSTS (JANUARY _____):

Energy as a basis (fixed plus variable costs):

US$15.24/MWh divided by US$6.04/MWh = US$21.28/MWh

Installed capacity basis (fixed plus variable costs):

US$7.23/kW divided by US$2.86/kW = US$l0.09/kW per month

LEVELIZED COST OF A NEW COAL-FIRED STATION @65% LF

	FIXED			VARIABLE			TOTAL
January ____	Capital	O&M	Total	O&M	Fuel	Total	Total
$/kW pm							
$/MWh							

2. RATES USES IN THE SCHEDULES:

2.1 PARTICIPATION POWER AND SYSTEM PARTICIPATION POWER:

The capacity rate for Participation power (Schedule L) is deemed not to exceed US$___ /kW per month (the fixed portion of the levelized cost of o new coal-fired station as determined above). The capacity rate for Short-Term or System Participation power (Schedule G) should not exceed 80 % of US$_____ /kW per month. This is equal to US$____ /kW per month or US$_____ /kW per day or US$_____ /kW per week.

The capacity rate for Participation Power in turn forms the basis for other capacity rates as given in the paragraphs that follow.

2.2 FIRM POWER AND SHORT - TERM FIRM POWER:

The capacity rate for Firm power (Schedule K) is taken to be 115 % of the maximum capacity rate for Participation power (i.e., 1.15 x ___ = US$_____ /kW per month. The 15 % represents the reserve margin required to make the power firm. It is the average between 10 % reserve for hydro plant and 19 % reserve for thermal plant.

The capacity rate for Short-Term Firm Power (Schedule F) is taken to be the same as the capacity rate for Firm Power, converted to a weekly rate. (i.e., ____ divided by 4.33 = US$____ /kW per week.

2.2 PENALTY FOR SHORTAGE OF ACCREDITED CAPACITY:

The penalty is equal to five times the monthly rate for Participation power, or US$_____ /kW (see Appendix 1). The five times comes from the consideration that the annual peak can occur in any of the five coldest months of the year (May to September). The penalty is also set to make it unattractive to have insufficient Accredited Capacity compared to buying Participation Power or Firm Power.

2.4 EMERGENCY POWER:

The rate for Emergency Energy ((Schedule A) is equal to US$_____ /MWh, which is equal to 150% of the total levelized cost in MWh of a new coal-fired station.

____ x 1.5 = ____

2.5 OPERATING RESERVE AND CONTROL AREA SERVICES:
The rate for Operating Reserve (Schedule H) and for Control Area Services (Schedule M) is equal to 20 % of the capacity rate for Participation Power, or US$____ /MW per day.

20 % x $_____ /kW x 12 divided by 365 = ____

TABLE 1

SCHEDULED TRANSACTIONS
(PART 1: ENERGY EXCHANGES)

SCHEDULED TRANSACTION	DURATION (NOTICE)	ENERGY RATE	CAPACITY RATE	WHEELING CHARGE (IF ANY)	TYPE OF WHEELING
EMERGENCY ENERGY	<6 HRs	$__/mwH <115% SRMC	--- ---	TO BE ADDED AND PAID BY BUYER	FIRM
ECONOMY ENERGY (Thermal to Thermal or Hydro)	(0 HRs)	Th: SHARE SAVINGS Hy: <115% SRMC	--- ---	INCLUDED IN SAVINGS CALCUL.	NON-FIRM
SURPLUS ENERGY (Hydro to Thermal or Hydro)	(0 HRs)	Th: 75% SRMC Hy: CONSENT	--- ---	INCLUDED IN CHARGES	NON-FIRM
SYSTEM ENERGY	(1 HR)	<120% SRMC <135% SRMC	--- ---	TO BE ADDED AND PAID BY BUYER	NON-FIRM NON-FIRM

(from Thermal)

SYSTEM ENERGY (from Hydro to Thermal)	(>1 HR) (24 HRs)	<120% SRMC <135% SRMC	--- ---	TO BE ADDED AND PAID BY BUYER	NON-FIRM NON-FIRM
ENERGY BANKING (SHORT-TERM)	MAX. WKLY. CYCLES	SHARE SAVINGS	--- ---	INCLUDED IN SAVINGS CALCU.	NON-FIRM
ENERGY BANKING (LONG TERM)	LONGER CYCLES	<120% SRMC >80% SRMC	--- ---	TO BE ADDED AND PAID BY BUYER	NON-FIRM
SCHEDULED OUTAGE ENERGY	NOT SPECIFIED	<115% SRMC (SELLER) >115% SRMC (BUYER)	--- ---	TO BE ADDED AND PAID BY BUYER	NON-FIRM

TABLE 2

SCHEDULED TRANSACTIONS (PART 2: CAPACITY EXCHANGES)

SCHEDULED TRANSACTION	DURATION (NOTICE)	ENERGY RATE	CAPACITY RATE	WHEELING CHARGE (IF ANY)	TYPE OF WHEELING
OPERATING	1 MO. >(24 HRs)	SYSTEM ENERGY SHORT-TERM FIRM POWER	$__/MW/DAY	TO BE ADDED AND PAID BY BUYER	NON-FIRM
SYSTEM PARTIC. POWER	7 DAYS - 6 MOS.	Th: <115% SRMC Hy: <80% SRMC	$___/kW/WEEK $__/kW/MO.	TO BE ADDED AND PAID BY BUYER	FIRM FIRM
PARTIC. POWER	>6 MOS.	Th: <115% SRMC Hy: 80% SRMC	$___/kW/mo.	TO BE ADDED AND PAID BY BUYER	FIRM
SHORT-TERM POWER	7 DAYS - 6 MOS.	Th: <115% SRMC Hy: 80% SRMC	$___/kW/WEEK	TO BE ADDED AND PAID BY BUYER	FIRM
FIRM POWER	> 6 MOS.	Th: <115% SRMC Hy: <80% SRMC	$___/kW/MO.	TO BE ADDED AND PAID BY BUYER	FIRM

SOUTH ASIA POWER POOL

OPERATING GUIDELINES

PREAMBLE

The objective of this document is to ensure that all the Operating Members of the South Asia Power Pool (SAPP) operate the interconnected South Asia network efficiently and effective and that all Members participate equitably in the obligations and in the benefits resulting from the Pool. The Operating Sub-Committee of the SAPP will amend these Guidelines from time to time, as the need arises.

All interconnected utilities to SAPP must comply with the contents of this document. It can also be used as a basis to prepare more detailed documents governing the operation of each individual network.

This document is based on the North American Electric Reliability Council (NERC), Operating Guidelines (27 February 1991). It will enable all the Operating Members to monitor the operations of the Southern African Grid and to compare them against a benchmark.

The English language, both written and spoken, will be the medium of official communication between the Operating Members of the SAPP.

The Operating Guidelines are designed to ensure coordinated operation between interconnected systems and to achieve high levels of system reliability and control at the Points of Interconnection.
The Guidelines specify how the basic operating policy of the SAPP shall be implemented. The Guidelines are based on established technical rationale and on operating experience accumulated over the years. The input of the System Controller is vital to the establishment and maintenance of good operating policy.

In practice, certain Clauses are more important than others. Therefore, the Clauses are classified either as Operating Requirements or as Operating Recommendations.

An Operating Requirement is a statement that describes the obligations of a Control Area or of a System functioning as part of a Control Area. The Operating Requirement may also specify whether compliance to Guidelines must be monitored or not.

An Operating Recommendation is a statement describing good operating practice that should be followed by a Control Area or by a System belonging to a Control Area. The degree of enforcement of an Operating Recommendation may vary from Control Area to Control Area and should take into account system conditions and characteristics.

SUMMARY OF OPERATING GUIDELINES

GUIDELINE 1: SYSTEM CONTROL

A. GENERATION CONTROL

Each Control Area shall operate sufficient generating capacity under automatic control to meet its obligation to continuously balance its generation and interchange schedules with its load. It shall also provide a contribution to System frequency regulation as defined hereafter.

B. VOLTAGE CONTROL

Each System and Control Area shall operate capacitive and inductive reactive resources so as to maintain within specified limits, the voltage levels inside the Systems and at the Points of Interconnection. Reactive power generation, transmission equipment switching and load shedding, if necessary, shall be implemented to maintain these voltage levels. Each System and Control Area shall have adequate MVAr reserves so as to maintain the voltage to acceptable levels under credible contingency conditions.

C. TIME AND FREQUENCY CONTROL

Frequency in the Interconnection shall be scheduled at 50 Hz and maintained to that value except for those periods in which frequency deviations are scheduled to correct time error.

Return of Inadvertent Energy and correction of time errors shall be scheduled and carried out within the range of frequencies specified in this document and bearing in mind that Interconnection reliability has first priority.

Each Control Area shall participate in the correction of time error.

Control Areas that are interconnected shall select one Control Area each year to monitor time error and to issue time error correction orders.

D. INTERCHANGE SCHEDULING

The scheduling of power transfers between Control Areas shall be done through transmission paths either belonging to those Control Areas or pre-arranged via wheeling contract(s) when other Control Areas are involved.

The net amount of interchange scheduled between Control Areas shall not exceed the mutually agreed transfer limits of the interconnectors and alternate paths that are involved in the scheduled power transfer. When establishing normal and emergency transfer limits, the sending party, the wheeling party and the receiving party shall consider the effects of the power transfer through their own and all other parallel Systems based on acceptable criteria. In no case shall the scheduled power transfer between two Control Areas exceed the total rated capacity of transmission facilities owned or arranged for between the two Control Areas.

Alterations to power transfer schedules, shall be made at a time and at a rate of change agreeable to both the supplier and receiver and within the capability of each party to control the change.

E. CONTROL PERFORMANCE CRITERIA

The Control Performance Criteria defines a minimum standard of control performance. Each Control Area should operate its System(s) above this minimum requirement and the actual level of performance should be the highest that can be achieved, taking into account economic and technical considerations.

F. INADVERTENT ENERGY MANAGEMENT

Through reliable metering equipment and daily schedule verification, each Control Area shall accurately account for Inadvertent Energy interchanges. Being aware of generation and load patterns, each Control Area shall be proactive in preventing the accumulation of Inadvertent Energy. Each Control Area shall be obliged to return accumulated Inadvertent Energy and to do this in accordance with the procedures set by the Operating Sub-Committee.

Each Point of Interconnection between Control Areas shall be equipped with a common MWh meter and the readings shall be provided hourly to all relevant Control Centres.

G. CONTROL SURVEYS

At least every six (6) months, the Coordination Centre, or its representative, shall conduct a survey to assess the control performance of the Control Areas. The purpose of these surveys will be to highlight control equipment malfunctions, telemetering errors, improper frequency bias settings, scheduling errors, inadequate generation under automatic generation control, general control performance deficiencies and any other factors contributing to inadequate control performance.

H. CONTROL EQUIPMENT REQUIREMENTS

The control equipment of each Control Area shall be designed and operated so as to ensure that the Control Area can continuously and accurately meet its control obligations (towards its own System(s) and towards the other Control Areas) and that it can measure its performance. The control equipment shall be designed and operated in accordance with acceptable industry norms.

All interconnections between Control Areas shall be equipped to telemeter MW power flow at the Points of Interconnection to area Control Centres simultaneously.

The System Controller's displays and consoles shall offer him a clear and understandable picture of his Control Area parameters. This includes all the necessary information from other Control Areas in addition to his own.

GUIDELINE II: SYSTEM SECURITY

A. ACTIVE POWER (MW) SUPPLY

Each Control Area shall operate its active power resources to ensure a level of operating reserve sufficient to account for such considerations as errors in load forecasting and exchange schedules, generation or transmission equipment unavailability, number and size of generating units, forced outage rates, maintenance schedules, regulating requirements, and load diversity between Control Areas. Following the loss of load or active power resource(s), the Control Area shall take appropriate steps to reduce its Area Control Error to zero within ten (10) minutes.

Each Operating Member shall declare its own operating reserve philosophy with regard to the following:

(i) the permissible mix of spinning and quick reserve;

(ii) procedure for applying operating reserve policy in practice; and

(iii) the limitations, if any, upon the amount of interruptible load that may be considered as quick reserve.

This philosophy shall not be less onerous than the minimum reserve policy specified in these Guidelines.

B. REACTIVE POWER (MVAR) SUPPLY

Each Control Area shall supply its own reactive power requirements, including appropriate reserves to maintain voltage levels during a contingency. The reserve shall be located, electrically, where it can be applied effectively and timely when a contingency occurs.

Control Areas shall co-ordinate the use of voltage control equipment to maintain transmission voltages and reactive flows at levels consistent with interconnection security.

C. TRANSMISSION OPERATION

Transmission equipment is to be operated within its normal rated capacity except for short periods after a contingency has occurred.

When the loading or voltage level on transmission facilities deviate from normal operating limits or are likely to exceed emergency limits following a contingency, and when such events can threaten the reliability of the Interconnection, Control Area(s) experiencing or causing the condition, shall take immediate steps to remedy the situation. These steps include notifying other Control Centres, adjusting generation, modifying schedules between Control Areas, initiating load relief measures and taking all other actions that the situation warrants.

System operation shall be coordinated between Systems, Control Areas and the Pool. This includes the monitoring of MW and MVAr flows and the co-ordination of equipment outages, voltage levels and switching operations that affects two or more Systems.

D. RELAY COORDINATION

Systems and Control Areas shall co-ordinate the application, operation and maintenance of protective relays on the Interconnection, including the co-ordination of under-frequency load shedding relays. Criteria that will enhance system reliability with the minimum adverse affect on the performance of the Interconnection should be developed.

System Controllers shall be familiar with the operation and settings of protective relays and shall have access to all relevant relay information to enable them to operate the interconnected system.

E. MONITORING INTERCONNECTION PARAMETERS

Each System and Control Area shall continuously monitor those parameters (such as MW flows, MVAr flows, frequency, voltage, phase angle, etc.), internal and external to its System or Control Area, that indicates the level of security of the Interconnection.

The System Controllers shall be provided with all necessary infonT1ation to accomplish this objective. Meters with suitable range and reliability for both normal and emergency conditions shall be installed in the Interconnection.

F. INFORMATION EXCHANGE - NORMAL SYSTEM CONDITIONS

Information concerning system conditions shall be transmitted to adjacent Control Areas and non-adjacent Control Areas, as needed, to ensure efficient and effective operation of the Interconnection.

G. INFORMATION EXCHANGE – DISTURBANCE REPORTING

Disturbances or unusual occurrences that jeopardize the operation of the interconnected system that result, or could result, in equipment damage or customer supply interruption shall be studies in sufficient depth to increase the understanding of the phenomenon occurring in the interconnected system and to enable the members to prevent the occurrence of such incidents, or at least reduce their impact. The recordings associated with a disturbance shall be made available to the other Operating Members.

H. MAINTENANCE COORDINATION

Each System shall prepare inspection and maintenance schedules for its generation and transmission facilities, its protection, control and communication equipment and of any other relevant facility. These inspection and maintenance schedules shall be coordinated with those of other affected Systems and Control Areas to ensure that the equipment outages will not violate the reliability criteria.

GUIDERLINE III: EMERGENCY OPERATIONS

A. INSUFFICIENT GENERATION CAPACITY

A Control Area which experiences a shortage of generation shall promptly balance its generation and interchange schedules to its load, without regard to financial implications, to avoid prolonged use of the assistance provided by interconnection frequency bias. The emergency reserve provided in a frequency deviation is intended to be used only as a temporary source of emergency energy and is to be promptly restored so that the interconnected system can again withstand the next contingency. A Control Area unable to balance its generation and interchange schedules to its load shall have the responsibility to shed sufficient load to permit the correction of its Area Control Error.

A Control Area anticipating a shortage of generation shall bring to service all available generation, postpone equipment maintenance, -re-schedule interchange and prepare to shed load.

B. TRANSMISSION - OVERLOAD, VOLTAGE CONTROL

If a transmission facility becomes overloaded or if voltage/reactive levels are outside established limits and the situation cannot be remedied by normal means such as adjusting generation or

interconnection schedules, and if a credible contingency under these conditions would adversely impact on the Interconnection, appropriate measures, including load shedding, shall be implemented promptly to reduce the loading of the transmission facility to a level below the established limits. This action shall be taken by the System or Control Area causing the problem if that system or Control Area can be identified (otherwise by all Systems or Control Areas, as appropriate, if responsibility cannot be readily determined).

C. LOAD SHEDDING

After taking all other remedial steps, a System or Control Area whose integrity is still in jeopardy due to insufficient generation or transmission capacity, shall shed customer load rather than risk an uncontrolled failure of components making up the interconnection between Control Areas.

D. SYSTEM RESTORATION

After a system collapse, restoration shall begin when it can proceed in an orderly and secure manner. Systems and Control Areas shall coordinate their restoration actions. Generally, restoration starts with the auxiliary supply of power stations and transmission substations, Customer load shall be restored as generation and transmission equipment become available, recognizing that load and generation must continuously remain in balance c normal frequency as the system is restored.

E. EMERGENCY INFORMATION EXCHANGE

A System or Control Area that is experiencing or anticipating an emergency shall communicate its current and expected status to neighboring Systems and Control Area first and then to the other Operating Members. Systems capable of providing assistance shall declare their capabilities.

F. SPECIAL SYSTEM OR CONTROL AREA ACTION

Because the facilities of each System may be vital to the secure operation of the interconnection, Systems and Control Areas shall make every effort to remain connected the Interconnection. However, if a System or Control Area determines that it is endangered by remaining interconnected, it may take such action as it deems necessary to protect system.

If the interconnection splits into several parts, abnormal frequency and voltage deviation may occur. To permit re-synchronization, relief measures shall be brought by those Systems responsible for the frequency and voltage deviations.

G. CONTROL CENTRE BACK-UP

Each Control Area shall have a survival plan to continue operation of its Systems in the event its Control Centre becomes inoperable.

GUIDELINE IV: OPERATING PERSONNEL

A. RESPONSIBILITY AND AUTHORITY

Each System Controller shall be delegated sufficient status and authority to take any action necessary to ensure that the System or Control Area for which the Controller is responsible, is operated in a stable and reliable manner.

B. SELECTION

Each System and Control Area shall select its System Controllers based on criteria that are designed to promote reliable operation.

C. TRAINING

Each System and/or Control Area shall provide its personnel with training that is designed to promote reliable operation.

D. RESPONSIBILITY TO OTHER OPERATING GROUPS

Each System and Control Area's personnel shall supply the information required by other Systems, Control Areas or by the Operating Sub-Committee.

GUIDELINE V: OPERATIONS PLANNING

A. NORMAL OPERATIONS

Each Control Area shall plan its future operations in co-ordination with other affected Control Areas to ensure that normal interconnection operation will. proceed in an orderly and consistent manner.

B. PLANNING FOR SHORT-TERM EMERGENCY CONDITIONS

A set of plans consistent with these Operating Guidelines (particularly Guideline III) shall be developed, maintained, and implemented as required by each System and Control Area to cope with operating emergencies. These plans shall be coordinated with other Systems and Control Areas as appropriate.

C. PLANNING FOR LONG-TERM EMERGENCY CONDITIONS

Each System and Control Area shall maintain comprehensive and coordinated procedure, to deal with long-term capacity or energy shortages.

D. LOAD SHEDDING

Each System and Control Area shall prepare a program of manual and automatic load shedding sufficient to arrest frequency or voltage decay, or extreme power flows that could cause an uncontrolled failure of components of the Interconnection. The program shall be coordinated throughout the Interconnection so as to avoid high transmission loading and extreme voltage deviations.

E. SYSTEM RESTORATION

Each System and Control Area shall develop and periodically update a plan of action restore its system in an orderly manner in the event of a partial or total shutdown. This plan shall be coordinated with other Control Areas to ensure a consistent Interconnection restoration.

Reliable and adequate sources for starting up generating units shall be provided in each System. When these sources are remote from the generating units, a proper procedure shall be established in order to minimize start-up time. Generation restoration procedures shall be verified and tested at regular intervals to be defined by the Operating Sub-Committee.

GUIDELINE VI: TELECOMMUNICATIONS

A. FACILITIES

Each System and Control Area shall install adequate and reliable telecommunication facilities for their own needs and those of other Systems and Control Areas so as to ensure that the exchange of information necessary to maintain the reliability of the Interconnection can take place. Wherever possible, there will be back-up facilities and route diversity.

B. SYSTEM CONTROLLER TELECOMMUNICATION PROCEDURES

Procedures for System Controller to System Controller communications shall be established by Systems and Control Areas to ensure that communications between operating personnel are consistent, efficient, and effective during normal and emergency conditions.

C. LOSS OF TELECOMMUNICATIONS

Operating instructions and procedures shall be established by each System and Control Area to enable operation to continue during the loss of telecommunication facilities.

TERMS USED IN THE GUIDELINES

Adjacent System or Adjacent Control Area: Any System or Control Area directly interconnected with (so as to be significantly affected by the existence of) another System or Control Area.

Area Control Error (ACE): The instantaneous difference between actual and scheduled tie interchanges between Control Areas, taking into account the difference between the scheduled actual frequency.

Automatic Generation Control (AGC): Equipment that automatically adjusts a Control Area generation from a central location to maintain its interchange schedule and frequency.

Capacity Emergency: A Capacity Emergency exists when a System's or Control Area's operational capacity, plus firm purchase from other Systems, to the extent available or limited by transmission capability, is inadequate to meet its demand plus its regulating requirements.

Cold Reserve: Cold Reserve is all generating capacity available for operation but not synchronizing to the system; it is the Slow Reserve plus Quick Reserve.

Control Area: Control Area shall mean an electrical System with borders defined by Points of Interconnection and capable of maintaining continuous balance between the generation under

Control, the consumption of electricity in the Control Area and the scheduled interchanges with other Control Areas.

Control Performance Criteria (CPC): The CPC survey provides two measures of performance of ACE. These measures are referred to as A1 - Zero Crossing, and A2 - Compliance.

Demand: The rate at which energy is being used by the customer, expressed in MW or GW.

Disturbance:

1. Any perturbation to the electric system.

2. The unexpected change in ACE that exceeds five (5) times Ld that is caused by the sudden loss of generation or interruption of load.

Dynamic Schedule: A schedule that is continuously adjusted in real time to match an ac interchange. Commonly used for "scheduling" generation from another Control Area.

Emergency Energy. Emergency Energy shall mean energy supplied from other Operating Members to an Operating Member who experiences a loss of generating or transmission facilities the result of an unscheduled outage (or outages) or any cause not reasonably foreseeable. Such energy shall be available for a period six (6) hours starting from the occurrence of emergency, after which the Operating Member must obtain other types of services or shed 10 should the shortage continue.

Emergency Situation: An Emergency Situation shall mean a situation where a Member is faced with an unplanned loss of generation of transmission facilities or another situation beyond its control, which impairs or jeopardizes its ability to supply its System Demand, adjusted for imports and exports of Firm Power. Such emergency shall not exceed six (6) hours.

Force Majeure: Force Majeure shall have the same meaning as in Clause 2.18 of the SAPP Agreement Between Operating Members shall apply, except for Clause 2.18.4 which shall read as follows:

"any other cause beyond the control of a Party , provided the Party experiencing such cause and the other Party agree that such cause should be regarded as Force Majeure".

Frequency Bias Setting: A value, in MW/0,1 Hz, set into a Control Area's AGC equipment to represent a Control Area's response to deviation from scheduled frequency.

Hourly Value: Data measured on a clock-hour basis. When related to energy or similar data, it is the value accumulated during the sixty (60) minute interval ending at the hour that is specified.

Inadvertent Energy Flow: Inadvertent Energy Flow shall mean the difference between the net scheduled energy delivered and the actual net energy delivered in any specific hour.

Interconnection: When starting with a capital letter, it shall mean high voltage transmission lines and substations making up the international backbone of the South Asia Grid. When not starting with a capital letter, it shall mean the facilities that connect two adjacent Systems or Control Areas.

Interruptible or Curtailable Load: Interruptible or Curtailable Load shall mean a consumer load or a combination of consumer loads which can be contractually interrupted or reduced by remote control or on instruction from the utility when such contracts are in place and such instructions have been given from the Member's Control Centre.

Leap Second: A second of time added occasionally by the Bureau of Standards to correct for the offset between the clock-hour day and the solar day.

Ld: See Guideline I on System Control.

Load: The amount of electric power delivered or required at any specified point or points on a system.

Metered Value: A measured (electrical) quantity that may be collected by telemetering or SCADA.

Mothballing: Mothballed plant stored for longer than one (1) year; the plant is dry stored, partially dismantled and specifically protected.

Non-Spinning Reserve: Shall have the same meaning as Cold Reserve.

Neighboring System: See Adjacent System.

Net Energy for Load: Net system generation plus interchange received minus interchange delivered in a time interval.

Operating Reserve: The un-used capacity above System Demand that is required to cater to regulation, short-term load forecasting errors, and unplanned outages. It consists of Spinning and Quick Reserve.

Operating Security. The ability of a power system to withstand or limit the adverse effects of a credible contingency to the System including overloads beyond emergency ratings, excessive inadequate voltage, loss of stability or abnormal frequency deviations.

Planned Outage: Unless otherwise agreed and confirmed in writing between all relevant Control Centres, Planned Outages shall mean outages which are scheduled with at least two weeks notice and agreed in writing between the Control Centres.

Points of Interconnection: The Points of Interconnection between Operating Members shall those locations where their respective transmission facilities are physically connected. Unless otherwise agreed, the transactions under the Service Schedules shall be deemed to take place at the Points of Interconnection. The Management Committee shall update from time to time, the giving the Points of Interconnection between the networks of the Operating Members.

Quick Reserve: Quick Reserve is interruptible load or capacity readily available from Operating Reserve that can be started and loaded within ten (10) minutes to meet the system demand. This includes hydro plant, gas turbines, pumped storage and interruptible load.

Reserve Storage: Reserve Storage is plant that is stored for more than three (3) months in a wet or dry stored condition. Some auxiliary plant may be run periodically.

Regulating Margin: The on-line capacity that can be increased or decreased to allow the system to respond to all reasonable demand changes in order to comply With the Control Performa Criteria.

SAPP: South Asia Power Pool.

Service Schedules: Service Schedules shall mean schedules governing various types of service.

Slow Reserve: Slow Reserve is capacity available from Cold Reserve and considered to be ready for synchronization to the system within twenty-four (24) hours. The purpose of slow reserve is to replace any generating units on unplanned outages or to meet forecasted demand.

Special Protection System (SPS): Shall mean a protection scheme designed to perform functions other than the isolation of electrical faults; it is also called "remedial action scheme". See Guideline II "Relay Co-ordination".

Spinning Reserve: Spinning Reserve shall mean the unused capacity which is synchronized to the System and which can be delivered immediately without manual intervention.

Station Service: Shall mean the electric supply to ancillary equipment used to operate a generating station or substation.

Station Service Generator. Shall mean a generator used to supply electrical energy to station service equipment.

Supervisory Control and Data Acquisition (SCADA): Shall mean a system of remote control and telemetry used to monitor and control the transmission system.

System: A combination of generation, transmission, and other components making up the network of an electric utility, or group of utilities.

System Controller. A person who controls the electric system.

Time Error Monitor (Monitor): Control Area designated to monitor time errors.

Unplanned Outage: Unless otherwise agreed and confirmed in writing between all relevant Control Centres, Unplanned Outages shall mean outages that are not scheduled with the advance notice of two weeks and agreed in writing.

Wheeling: Wheeling shall mean transmitting a contractual amount of power over specified time periods through the System of an Operating Member who is neither the Seller nor the Buyer of this power.

GUIDELINE I: SYSTEM CONTROL

A. GENERATION CONTROL

Criteria:

Each Control Area shall operate sufficient generating capacity under Automatic General Control (AGC):

(1) to continuously balance its generation and interchange schedules to its load,

(2) provide its contribution to interconnection frequency regulation, as specified hereafter.

Requirements:

1. Automatic Generation Control (AGC) shall continuously compare:

(i) total net actual interchange adjusted for actual frequency and;

(ii) total net scheduled interchange adjusted for scheduled frequency;

to determine the Control Area's Area Control Error (ACE) and respond by return the ACE to zero.

2. Each Control Area shall provide an amount of Spinning Reserve responsive to control area that is synchronized to the Interconnection. This amount shall be raise lowered by AGC to provide adequate system regulation and to satisfy Cc Performance Criteria.

3. Each Control Area shall operate its AGC on tie-line bias mode, unless operation is adverse to System or Interconnection reliability. The requirements for tie-line bias control are as follows:

3.1 The Control Area shall set its frequency bias (expressed in MW/0,1 Hz as close as practical to the Control Area's frequency response characteristics. Frequency bias may be calculated in several ways:

3.1.1 A fixed frequency bias value may be used which is based on a straight-line function of tie-line deviation versus frequency deviation. The fixed value shall be determined by recording and averaging frequency response characteristic after several disturbances during peak hours.

3.1.2 A variable (linear or non-linear) frequency bias value may be used which is based on a variable function of tie-line deviation versus frequency deviation. The variable frequency bias value shall be determined by analyzing frequency response as it varies with parameters such as load, generation, governor characteristics and frequency.

3.2 The Operating Sub-Committee shall approve performance standards applicable to frequency bias.

3.2.1 In no case shall the monthly average frequency bias be less than 1% of the Control Area's estimated yearly peak demand per 0,1 Hz.

3.3 Each Control Area shall review its frequency bias settings by 1 January of each year and shall recalculate its settings to reflect any change of frequency response characteristic in the Control Area.

3.3.1 The bias setting or the method used to determine the setting may be changed whenever any of the parameters listed in Clause 3.1.2 above changes.

3.4 Each Control Area must be able to prove to the Operating Sub-Committee that its frequency bias settings closely match its frequency response characteristic.

3.5 Each Control Area shall communicate its frequency bias setting and the method for determining that setting to the Operating Sub-Committee.

Recommendations:

1. AGC should be in service all the time and when not possible, arrangements must be made to include the System in an established Control Area or to switch over to temporary manual control.

2. Turbine governors and other control systems, including AGC and HVDC control systems should be tested periodically to verify their correct operation. The maximum intervals between such tests shall be specified by the Operating Sub-Committee.

3. Turbine governors and HVDC controls, where applicable, should respond to system frequency deviation, unless there is a temporary operating problem.

4. Each Member should establish normal and emergency rates of response for each generator and each HVDC terminal.

5. Load-limiting devices should be applied only when the rate of load change has a adverse effect on the generators or when it can jeopardize transmission security.

6. The Regulating Margin should be distributed between as many generating units as possible.

7. Each Control Area should schedule its generation so as to comply with the Control Area's Performance Criteria for any expected change in load characteristics and daily load patterns.

8. All generating units of consequential size should be equipped with AGCs to ensure that the Control Area continuously adjusts its generation to its load plus its non-scheduled interchange.

9. Frequency dead band be set to less than 0,05 Hz.

10. ACE dead band be set to less than 0,05 Hz.

Background:

Accurate and adequate generator control helps reduce time error, frequency deviations and Inadvertent Energy interchanges.

Each Control Area will respond to frequency deviations in accordance with the frequency response characteristic of its own System. Most of this response will be reflected in the Control Area's net interchanges. By monitoring the interchange deviations from schedule and the frequency deviation from schedule, and by using the Control Area's frequency response characteristic, it is possible to determine through the AGCs, whether the imbalance between load and generation is internal or external to the Control Area. If internal, the AGC adjust the

generation to correct the imbalance. If external, no AGC action should occur. However, the frequency response to the interchange deviations through the governor should be allowed to continue until the external system with the generation surplus deficiency corrects its imbalance and returns the frequency to schedule.

Until actual system response can be continuously measured, it must be estimated. The estimate is the tie-line frequency bias setting. The closer the tie-line frequency bias matches the actual system frequency response, the better the AGC will be able to distinguish _____.

B. VOLTAGE CONTROL

Criteria:

Each System and Control Area shall maintain system and Interconnection voltages within agreed upon high and low limits by operating suitable capacitive and inductive reactive resources. Reactive generation scheduling, transmission equipment switching and load shedding, if necessary, shall be implemented to maintain these voltage limits. Each System and Control Area shall have adequate MVAr reserves to maintain voltage levels under credible contingency conditions.

Requirements:

1. Devices used to regulate transmission system voltages and reactive flows should be under the control of the Control Centre.

2. Control Centres shall monitor transmission system voltages to immediately identify any deviation from prearranged voltage levels and take corrective action. (see Appendix 1.B "Transfer Capability").

2.1 Pre-arranged voltage levels, reactive control equipment settings and changes in transmission configuration shall be coordinated with adjacent Systems.

2.2 Transfer limits shall take into account voltage or reactive power restrictions. These restrictions should be clearly displayed in each Control Centre.

2.3 Control Centres shall monitor and keep reactive power flows within agreed upon limits on the interconnectors between neighboring systems.

Recommendations:

1. Important transmission lines should remain in service during light-load periods whenever possible. They should be removed from service for voltage control only after all reactive power sources have been utilized and only if studies indicate that system reliability will not be degraded below acceptable levels. Whenever possible, switching lines out for voltage control, shall be restricted to lines other than the interconnectors between neighboring systems.

2. Automatic voltage regulators on generators, synchronous condensers and Static Var Compensators (SVCs) shall be kept in service whenever possible.

3. When a generator's automatic voltage regulator is out of service, field excitation may be maintained at a level adequate for stable operation.

4. Systems with HVDC transmission facilities shall utilize the reactive power reserve associated with the DC converters.

C. TIME AND FREQUENCY CONTROL

Criteria:

Interconnection frequency shall be scheduled at 50 Hz and controlled to that value for those periods in which frequency deviations are scheduled to correct time error.

Operating limits for frequency deviation and time error shall be established with Interconnection reliability as first priority.

Each Control Area shall participate in all time error corrections.

One Control Area shall be selected every year to monitor the time error of each Interconnection and to issue time error correction orders.

Requirements:

1. Every year the Operating Members shall designate a Control Area (the Monitor) that shall monitor time error and initiate or terminate corrective actions when error reaches +/-10 seconds.

2. Time error corrections shall start and end on the hour, and notice shall be give at least thirty (30) minutes before the time error correction is to start or stop.

3. Each order of time error correction shall be identified (by a number).

4. The offset to carry out the time error correction shall be implemented as follows:

4.1 The frequency schedule may be offset by 0,02 Hz, leaving the frequency unchanged, or

4.2 If the normal frequency (50 Hz) cannot be offset, the net interchange schedule (MW) may be offset by an amount corresponding to a 0,0 frequency deviation (i.e. 20% of the frequency bias setting).

4.3 Inadvertent interchange accumulations may be paid back unilaterally by offsetting a tie-line schedule when such action will contribute to the correction of a time error.

4.3.1 If time is slow and there is a negative accumulation (undergeneration), the AGC may be offset to over-generate and pay-back inadvertent interchange accumulation and, at the same time, reduce time error.

4.3.2 If time is fast and there is a positive accumulation (over-generation), the AGC may be offset to under-generate and pay-back inadvertent interchange accumulation and reduce time error.

4.3.3 AGC offset may be made by either offsetting the frequency schedule up to 0,02 Hz, leaving the bias setting normal or offsetting the net tie-line schedule by up to 20% of the Control Area's bias or 5 MW, whichever is greater.

4.3.4 Inadvertent pay-back shall end when either the time error is zero or has changed signs, the accumulation of inadvertent interchange has been corrected to zero, or a scheduled time error correction begins, which takes precedence over offsetting frequency schedule to payback inadvertent.

5. Time error correction notifications will be broadcast by the Monitor to the Operating Members.

6. The Monitor shall periodically issue a notification of time error, accurate to within 0,1 second, to Members to ensure uniform calibration of time standards.

7. Each Control Area shall, at least annually, check and calibrate its time error and frequency devices against a common reference.

8. When one or more Control Areas have been separated from the Interconnection, upon reconnection, they shall adjust their time error devices to coincide with the Interconnection by one of the following methods:

8.1 Before connection, the separated area may institute a Time Error Correction Procedure to correct its accumulated time error to coincide with the indicated time error of the Monitor, or

8.2 After interconnection, the time error devices of the previously separated may be corrected to coincide with the indicated time error of the Monitor. The notification of adjusted time error shall be passed through the Monitor soon as possible after interconnection.

9. Time error correction procedures are found in Appendix I.A.

Recommendations:

1. The Control Areas may implement automatic time error control as part of their Area scheme.

1.1 If automatic time error correction is used, all Control Areas should participate.

1.2 Automatic time error control in progress should be suspended whenever announced time correction is to start.

2. Systems using time error devices that are not capable of automatically adjusting leap-seconds should arrange to receive advance notice of the leap-second and make the necessary manual adjustment in a manner that will not introduce disturbance into their control system.

Background:

The difference between load and generation results in frequency deviations from 50 Hz, and the integrated deviation appears as a departure from standard time.

The satisfactory operation of the Interconnected systems is dependent, in part, upon accurate frequency transducers and recorders and time error devices associated with all equipment.

D. INTERCHANGE SCHEDULING BETWEEN CONTROL AREAS

Criteria:

Power transfers between Control Areas shall be scheduled through transmission paths either belonging to those Control Areas or pre-arranged via wheeling contract(s) when other Control Areas are involved.

The net amount of interchange scheduled between Control Areas shall not exceed the mutually agreed transfer limits of the common interconnections and alternate paths that have been arranged for between the parties. When establishing normal and emergency transfer limits, the sending, wheeling, and receiving Control Areas shall consider the effect of power flows through their own and other parallel Systems or Control Areas based on mutually acceptable reliability criteria. In no case shall the scheduled power transfers between two Control Areas exceed the total installed capacity of own or pre-arranged transmission facilities between the two Control Areas.

Schedule changes shall be made at a time and rate agreeable to both the supplier and receiver and within the capability of each Party to control the change.

Requirements:

1. Interchanges shall be scheduled only between Control Areas directly interconnected unless there is a wheeling contract or mutual agreement with another Control Area(s) to provide wheeling services.

2. Interchange schedules or schedule changes shall not violate established reliability criteria in another system.

2.1 When Control Areas are interconnected in such a way that parallel flows present reliability problems, the affected Control Areas shall develop multi-Control Area interchange monitoring techniques and pre-determined corrective actions to mitigate or alleviate potential or actual transmission system overloads.

2.2 Transfer limits shall be re-evaluated and interchange schedules adjusted as soon as practicable if transmission facilities become overloaded or are taken out of service, or when changes are made to the bulk system which can affect transfer limits. These should be determined both in terms of transient stability and thermal rating and should be provided to the Control Centres on an on-going basis.

3. The maximum net scheduled interchange between two Control Areas shall not exceed the lesser of two values:

3.1 The total capacity of the transmission facilities in service between the two Control Areas owned by them or available to them under wheeling arrangements, contracts; or mutual agreements, or

3.2 The mutually established transfer capability between two Control Areas considering other transmission facilities available to them under wheeling arrangements. (Transfer Capability is defined in Appendix 1.B "Transfer Capability").

4. The sending, wheeling and receiving Control Areas that are parties to interchange transaction shall agree on the following:

4.1 The schedule's magnitude, starting and ending times.

4.2 A change of schedule must be entered five (5) minutes before the hour must reach the full magnitude on the hour.

4.3 The scheduled generation in one Control Area that is to be delivers another Control Area must also be scheduled with all wheeling Control Area unless there is a contract or mutual agreement among the sending, wheeling and receiving Control Areas to do otherwise.

5. Control Areas shall develop procedures to disseminate information on interchange, schedules and facilities out of service that may have an adverse effect on other Control Areas not involved in the scheduled interchange. The involved parties predetermine schedule priorities that will be used if a schedule reduction becomes necessary.

Background.

Scheduled interchanges must be coordinated between Control Areas to prevent frequent deviations, accumulation of inadvertent interchanges and violations of mutually a transfer limits.

E. CONTROL PERFORMANCE CRITERIA

Criteria:

The Control Performance Criteria defines a standard of minimum control performance. Each Control Area shall exceed this minimum as much as it can reasonably be done.

Requirements:

1. Two criteria shall be used to continually monitor control performance:

1.1 A1 Criteria: The Area Control Error (ACE) must return to zero at least every ten (10) minutes. Violations of these criteria are counted for each subsequent ten (10) minute period that the ACE fails to return to zero.

1.2 A2 Criteria: The average ACE for each of the 6 ten (10) minute periods during the hour (i.e. for the ten (10) minute periods ending at 10, 20, 30, 40, 50, and 60 minutes past the hour) must not exceed specific limits, referred to as Ld. These limits are determined from the Control Area's rate of change of demand characteristics. (See Section 2.1.2.1 in the "Control Performance Criteria Training Document appended to these Guidelines for the methods for calculating Ld).

2. Two criteria shall be used to continually monitor control performance during disturbances (see the "Control Performance Criteria Training Document" Section 2.2):

2.1 B1 Criteria: The ACE must return to zero within ten (10) minutes following the start of the disturbance.

2.2 B2 Criteria: The ACE must start to return to zero within one (1) minute following the start of the disturbance.

3. The ACE used to determine compliance to the Control Performance Criteria shall reflect its actual value, and exclude short excursions due to transient telemetering problems or other influences such as control algorithm action.

4. All Control Areas shall respond to control performance surveys that are requested by the Operating Sub-Committee.

Recommendations:

1. Each Control Area should comply with the A1 and A2 Criteria. A1 Criteria should be met at least 90% of the time and A2 Criteria on average 80% for each month.

Background.

Control performance is the degree to which a Control Area succeeds in matching its generation to its demand plus scheduled power interchanges taking into account the effects of frequency bias. The Control Performance Criteria (CPC) establishes minimum standards for control performance.

F. INADVERTENT ENERGY MANAGEMENT

Criteria:

Each Control Area shall, through daily schedule verification and the use of reliable metering equipment, accurately account for Inadvertent Energy interchanges. Recognizing generation and load patterns, each Control Area shall do its best to prevent inadvertent interchange accumulation. Each Control Area shall reduce accumulated Inadvertent Energy.

At least a common MWh meter, with readings provided hourly to the relevant Control Centres shall measure the power transfers at each Point of Interconnection between Control Areas.

Accumulation of Inadvertent Energy.

Inadvertent Energy is defined to be the difference between the net scheduled energy tie-lines in a Control Area and net actual energy delivered on the tie-lines in that Control Area.

The Inadvertent Energy needs to be monitored and managed carefully.

Requirements:

1. Inadvertent Energy interchange shall be calculated and recorded hourly and accumulated as a credit or debit to a Control Area (see the "Inadvertent Interchange Accounting Training Document appended to these Guidelines).

2. All interchanges, between Control Areas, shall be included in the Inadvertent Energy interchange account.

3. Inadvertent Energy interchange accumulations shall be paid back by any one of the following methods:

3.1 Method 1: Inadvertent Energy interchange accumulations may be paid by scheduling interchange with another Control Area.

3.1.1 The other Control Area must have an inadvertent accumulation in the opposite direction.

3.1.2 The scheduled amount of inadvertent pay-back shall be agreed by all Control Areas involved.

3.2 Method 2: Inadvertent Energy interchange accumulation may be paid back unilaterally by offsetting tie-line schedules when such action will contribute to the correction of the existing time error.

3.2.1 If time is slow and there is a negative accumulation (undergeneration), the AGC may be offset to over-generate and pay-back inadvertent interchange accumulation and reduce time error.

3.2.2 If time is fast and there is a positive accumulation (over-generation), the AGC may be offset to under-generate and pay-back inadvertent interchange accumulation and reduce time error.

3.2.3 AGC offset may be made by either offsetting the frequency schedule by up to 0,02 Hz, leaving the bias setting normal or offsetting the net tie-line schedule by up to 20% of the Control Area's bias or 5 MW, whichever is greater.

3.2.4 Inadvertent pay-back shall end when either the time error becomes zero or has changed signs, the accumulation of inadvertent interchange has been corrected to zero, or a scheduled time error correction begins, because this action takes precedence over offsetting frequency schedule to pay-back inadvertent.

3.2.5 Control Areas using automatic time error control techniques shall not use Method 2 to reduce their accumulations of inadvertent Method 1 is the only acceptable way for these Control Areas to reduce their accumulations of inadvertent

4. Inadvertent Energy interchange accumulated during on-peak hours shall be paid back during on-peak hours. Inadvertent Energy accumulated during off-peak hours shall be paid back during off-peak hours.

5. Each Control Area shall submit a monthly summary of Inadvertent Energy interchange as detailed in Appendix I.C "Inadvertent Interchange Energy Accounting Practices".

5.1 Inadvertent Energy summaries shall include at least the previous accumulation, net accumulation for the month, and final net accumulation, for both on-peak and off-peak periods.

5.2 Each Control Area shall submit its monthly summary report to the Operating Sub-Committee.

5.3 Each Operating Sub-Committee representative shall distribute a monthly summary to their respective Control Areas as agreed upon.

Background:

Inadvertent Energy is the difference between the Control Area's net actual interchange and net scheduled interchange. Inadvertent interchange is partially due to the frequent deviations occurring on the Interconnection. Unintentional Inadvertent Energy interchange are due to instrument and control errors, improper control settings, poor generator response time, fluctuations in demand, etc.

Criteria:

The Coordination Centre shall request control performance surveys bi-annually whenever required. These surveys shall serve the purpose of identifying control equipment malfunctions, telemetering errors, improper frequency bias settings, scheduling errors, insufficient generation under automatic generation control, general control perform, deficiencies, or other factors contributing to inadequate control performance.

Requirements:

1. The following surveys, as described in the Control Performance Criteria Training Document, shall be conducted when called for by the Coordination Centre:

1.1 An Area Control Error survey to determine the Control Areas' interchange error(s) due to equipment failures, improper scheduling operation or improper AGC performance.

1.2 An Area Frequency Response Characteristic survey to determine the Control Areas’ response to changes in system frequency.

1.3 A Control Performance Criteria survey to monitor the Control Areas' performance during normal conditions and during disturbances.

H. CONTROL EQUIPMENT REQUIREMENTS

Criteria:

The control equipment of each Control Area shall be designed and operated to enable the Control Area to continuously meet its System and Interconnection control obligations and measure its performance. The control equipment shall be designed and operated in accordance with accepted industry norms.

All Control Area interconnections shall be equipped to telemeter MW power flows at the Points of Interconnection to both area Control Centres simultaneously. The telemetering shall be from an agreed-upon terminal utilizing common metering equipment.

The Control Centre displays and consoles shall present a clear and understandable picture of Control Area parameters. This shall include the necessary information from the Control Area itself as well as all the necessary information from other Control Areas.

Requirements:

1. Each Control Area shall perform control error checks at the end of every hour using tie-line MWh meters to determine the accuracy of its control equipment.

2. The Control Centre shall adjust control settings to compensate for equipment error until repairs can be made.

3. All tie-line flows between Control Areas shall be included in each Control Area's ACE calculation.

4. Control Centres shall be provided with a recording of all variables necessary to monitor control performance, generation response, and after-the-fact analysis of area performance. As a minimum, Area Control Error (ACE), system frequency, and net actual tie-line interchanges shall be continuously recorded.

5. Adequate and reliable back-up power supplies shall be provided and periodically tested at the Control Centres and other critical locations to ensure continuous operation of AGC and vital data recording equipment during the loss of normal power supply.

6. All tie-line MW and MWh/hr measurements shall be telemetered to both Control Centres and shall originate from a common, agreed upon terminal using common primary metering equipment.

APPENDIX 1.A: TIME ERROR CORRECTION PROCEDURES

1. A time correction may be terminated after five (5) hours or after any hour in which t correction of 0,5 seconds has NOT been achieved. A time correction may be extended beyond five (5) hours if the average correction has exceeded 0,5 seconds per hour.

2. After the termination of a time correction because of the "5-hour rule" above, or failure to make a correction of 0,5 seconds per hour, a slow time correction may be reinstated the frequency has returned to 50 Hz or above for a period of sixty (60) minutes. A fast correction can be reinitiated after the frequency has returned to 50 Hz or lower for a period of sixty (60) minutes. At least one (1) hour should elapse between the termination and initiation notices.

3. The Monitor may postpone or cancel a time correction if requested to do so by any Member or if warranted by the overall capacity situation.

4. The time reference for the South Asia Power Pool is UTC (Universal Time Coordinated) plus ___ (_) hours.

APPENDIX 1.B: TRANSFER CAPABILITY

1. STUDY METHOD

The transfer limits must be determined for normal operation and emergency conditions using steady state, stability and voltage collapse models. This must be done using, as far as possible, the N-1 criteria. These limits must be identified and the limit that will have the most severe consequences if exceeded, should be recommended as the transfer limit to the appropriate Control Centres. If an operating condition in a system creates a problem, it shall be reflected in the calculation of the transfer limit of the tie-line.

2. CONTINGENCIES

The following single contingencies are recommended:

2.1 Steady State:

- Loss of any transmission line having an impact on the loading of the tie-lines
- Loss of the largest reactive power source
- Evaluation of the danger of voltage collapse

2.2 Transient Condition:

- System intact:
    - Step-up transformer in the _____ system
    - Loss of one or several generators due to a common cause
    - Tripping of one large generator in the _____ system
    - Loss of any transmission line or tie-line that could have an impact on the interconnected system
- Evaluate the ARC policy on tie-lines
- Evaluate auto-reclose following single line-to-ground fault

3. RESULT ANALYSIS

The results of the above studies must show that the following criteria are met

3.1 Steady State:

- No transmission line or transformer should be loaded more than 100% nameplate rating.

- The busbar voltages should remain within the following bands:

Normal Operation:

VOLTAGE	MINIMUM KV (PU)	MAXIMUM KV (PU)

The voltage at the following power stations must remain within the following bands:

For a N-1 criteria the voltage at _____ must remain within the following band:

3.2 Transient Condition:

- The interconnected systems must remain in synchronism following the disturbances mentioned in 2.2.
- Following the first swing, the busbar voltages on the Interconnection should not be lower than the values specified in the table below for more than 100 msec:

VOLTAGE	VOLTAGE DIP
400 kV	-10%
330 kV	-10%
275 kV	-10%
220 kV	-10%
132 kV	-10%

4. GENERAL

- The system to be studied should be clearly defined as well as the year to study;
- The transfer limits should be studied for peak and minimum load conditions;
- The output of each power station should be clearly specified;

During emergencies, the Control Centres can operate the lines at a higher loading than the transfer limits. During such conditions, the Control Centres must realize that they could experience severe voltage dips, should a fault occur. These risks must be accepted if transfer limits are exceeded.

A report has to be issued by the study group and evaluated by the OSC. The transfer limits shall be updated once the OSC accepts new results and recommendations.

APPENDIX I. C: INADVERTENT INTERCHANGE ENERGY ACCOUNTING PRACTICES

A. INTRODUCTION:

Uniform accounting practices will help to identify and eliminate errors. They will highlight poor control performances that contribute to the accumulation of inadvertent interchanges.

These practices outline the methods and procedures required to reconcile energy accounting and inadvertent interchange balances.

The Control Areas must adhere to the Operating Guidelines to properly monitor and account for inadvertent interchanges.

B. SCHEDULES:

All hourly schedules and schedule changes shall be agreed to between the relevant Control Areas prior to implementation. The Agreement shall cover magnitude, rate of change and common starting time.

Dynamic scheduling integrated on an hourly basis shall be agreed to between the Control Areas after the end of the hour, but in such a manner as not to impact on inaccurate account.

C. ACCOUNTING PROCEDURES:

1. Daily Accounting: Each Control Area shall agree with adjacent Control Areas the following quantities for each hour and on a daily basis:

1.1 Scheduled interchanges (MWh).
1.2 Actual interchanges (MWh) as derived from the SCADA system.
1.3 Total amounts during each day for on-peak and off-peak per operational purposes).

2. Monthly Accounting: After having agreed on scheduled and actual interchange during the on-peak and off-peak hours of each day, adjacent Control Area should verify that the accumulated values for the month end balance.

3. The on-peak and off-peak hours are defined as follows:

Saturdays: on-peak
off-peak
off-peak

Sundays: off-peak

D. ADJUSTMENTS FOR ERRORS:

1. Periodic adjustments shall be made to correct for differences between hourly telemetered MWh totals and the totals derived from the tariff meters on the tie-lines.

2. Adjacent Control Areas shall agree upon the differences described above and shall assign the relevant corrections to the on-peak and off-peak hours.

3. Any adjustment necessary due to known meter errors, transmission losses or other circumstances shall be split between on-peak and off-peak hours as appropriate.

GUIDELINE 11: SYSTEM SECURITY

A. REAL POWER (MW) SUPPLY:

Criteria:

Each Control Area shall operate its active power resources so as to ensure an operating reserve sufficient to account for such considerations as errors in forecasting, generation or transmission equipment unavailability, loss of generating units, forced outages, maintenance schedules, regulating requirements and load diversity between Control Areas. Following the loss of load or of active power resources, the Control Area should take appropriate steps to reduce its Area Control Error to zero within ten (10) minutes , protect itself against the next contingency.

The Operating Sub-Committee shall specify the operating reserve policy in terms of:

(i) the permissible ratio between Spinning and Quick Reserve,
(ii) the procedure for applying Operating Reserve policy in practice, and
(iii) the limitations, if any, upon the amount of interruptible load that may be considered as Quick Reserve.

1. Requirements:

1.1 The System Controller shall be kept informed of all generation and transmission resources available for use.

1.2 The System Controller shall have all the necessary information, including weather forecasts and past load patterns, to predict the system's next load pattern.

1.3 Each Operating Member shall provide, as a minimum, Operating Reserves as follows:

1.3.1 An amount of Spinning Reserve responsive to Automatic Ger Control (AGC), which is sufficient to provide normal reserve margin, plus

1.3.2 An additional amount of Operating Reserve sufficient to reduce Area Control Error to zero within ten (10) minutes following the generating capacity which would result from the most severe contingency. Interruptible load may be included in Quick Reserve provided that it can be interrupted in less than ten (10) minutes remain disconnected until replacement generation can be brought into service.

1.3.3 Additional resources shall be made available as soon as practicable to restore the necessary Operating Reserve after the initial reserve has been used as the result of an incident

1.4 In order to ensure compliance with Clause 1.3 above, the Operating Reserve shall be sufficiently dispersed throughout the system, shall take into account the effective contribution of

unused generating capacity in an emergency, the time required for these contributions to be effective, the transmission limitations at the time and all the local requirements that may exist.

1.5 All Operating Members shall from time to time, review the adequacy of their Operating Reserve policy by evaluating the impact of all relevant contingencies.

2. Operating Reserve Obligation:

Every Operating Member in SAPP shall be obliged to maintain their calculated portion of Operating Reserve sufficient to cover 150% of the loss of the sent out capacity of the largest generating unit in service in the Interconnection at that time. Furthermore, this operating reserve shall be sufficient to reduce the Area Control Error (ACE) to zero within ten (10) minutes after a loss of generation.

The Operating Reserve shall be made up of Spinning Reserve and Quick Reserve. At least 50% of the Operating Reserve shall be Spinning Reserve that will automatically respond to frequency deviations. Interruptible load may be included in the Quick Reserve provided that it can be interrupted remotely in less than ten (10) minutes from the Control Centre.

The above shall establish the minimum amount of Operating Reserve that each Operating Member will be obliged to carry and indicates the level below that a Member is at fault.

Each Member shall declare its annual peak demand and its largest unit that is in service, every time these values change.

The following formula shall be used to calculate the minimum System Operating Reserve Requirement (SORR) of an Operating Member;

$$SORR = PORR \times \frac{(2Ds \text{ divided by } Dt + Us/Ut)}{3}$$

where:

SORR = Minimum System Operating Reserve Requirement

PORR = Total Pool Operating Reserve Requirement

Ds = Individual System's Annual Peak Demand

Dt = Total Sum of Individual System's Annual Peak Demand

Us = Individual System's Largest Unit

Ut = Total Sum of Individual System's Largest Unit (sum of Us)

An example where the sharing of Spinning Reserve between Operating Members has been calculated, can be found on the following Table:

	Largest Generator	Maximum Demand	Operating Reserve	Spinning Reserve	Quick Reserve
PGCIL					

NEA
BDP
PDB
CEB

Recommendation:

The effect of station service generators on area security should be considered before they are shut down for economic reasons.

B. REACTIVE POWER (MVAR) SUPPLY:

Criteria:

Each Control Area shall supply its own reactive power requirements and shall keep appropriate reserves to maintain voltage levels during a contingency. This includes the Control Area's share of the reactive power required by the interconnections between Members' Systems. The reserves shall be located electrically where they can be applied effectively and timely when a contingency occurs.

Control Areas shall coordinate the use of voltage control equipment to maintain transmission voltages and reactive power flows at levels consistent with the Interconnection security.

Requirements:

1. The System Controller shall receive all the necessary information on available generation and flows of reactive power.

2. Reactive sources shall be operated so that scheduled voltages can be maintained under all normal and first contingency conditions.

3. Reactive energy sources shall be dispersed and located in such a way that they can be applied effectively and quickly when contingencies occur.

4. Prompt action shall be taken to restore reactive energy resources if these drop below acceptable levels.

5. The System Controller shall take all necessary actions, including load reductions, to prevent voltage collapse when reactive energy sources are insufficient

Recommendations:

1. Surveys to determine compliance with voltage limits and reactive power requirements should be conducted on a regular basis.

2. Reactive power reserves should be automatically applied in the event of an emergency.

C. TRANSMISSION OPERATION:

Criteria:

When line loadings, equipment loadings or voltage levels deviate from the ratings or are expected to exceed emergency ratings following a contingency, with the result that reliability of the Interconnection is at risk, Control Areas experiencing or causing condition shall take immediate steps to remedy the situation. These steps include informing other Systems, adjusting generation, changing schedules between Control Areas, initiating load relief measures and taking every other action that may be required.

Transmission system operation shall be coordinated between Control Areas. This includes coordination of equipment outages, voltage levels, MW and MVAr flows, and switching operations that affect two or more Systems.

Requirements:

1. System Controllers shall monitor all critical transmission system loadings and check that voltage limits and emergency ratings are not exceeded.

2. Transmission Planned Outages shall be coordinated with other Systems that are likely to be affected.

3. Transmission Forced Outages shall be communicated to any System that may be affected.

4. Forced Outages of key transmission facilities shall be communicated to all adjacent Systems as quickly as possible.

5. Each Control Area shall use appropriate, up-to-date studies as referenced establishing transmission operation procedures.

Recommendation:

Important transmission lines should be kept in service during light-load periods whenever possible. They should be removed from service for voltage control after all other reactive control measures have been implemented in full and provide that studies can show that system reliability is not degraded below acceptable loads.

D. RELAY COORDINATION:

1. Criteria:

Systems and Control Areas shall coordinate the application, operation and maintenance of protective relays on the Interconnection, including the coordination of under-frequency load shedding relays. They shall develop criteria that will enhance system reliability.

System Controllers shall be familiar with the intended operation of protective relays and shall have access to the information relating to the operation of these relays.

Requirements:

1. Appropriate technical information concerning protective relays shall be available in each Control Centre.

2. System Controllers shall be familiar with the purpose, operation and limitations of protection schemes.

3. If equipment or protection relay fails and reduces system reliability, the appropriate personnel shall be notified and corrective action shall be carried out as soon as possible.

4. All new protective schemes and all modifications to existing protective schemes shall be coordinated between neighboring Systems if these neighboring Systems are affected by the change.

5. Protection on major transmission lines and interconnections shall be coordinated with other interconnected Systems.

6. Neighboring Systems shall be notified in advance of changes in generating sources, transmission, load or operating conditions that could require changes in their protection schemes.

7. The Control Centres shall monitor the status of every Special Protection System (SPS) and notify all affected Systems of each status change.

Recommendations:

1. Protection design and operation should consider the following:

1.1 Protection schemes should be of minimum complexity consistent with achieving their purpose.

1.2 Back-up protection schemes should be in service to enable Members to carry out normal maintenance and calibration on the main protective scheme without having any impact on protection availability.

1.3 Protection schemes should not normally operate for brief overloads, transient surges or power swings.

1.4 High-speed relays, high-speed circuit breakers and automatic reclosing facilities should be used where studies show that their application will enhance stability. Single pole tripping and reclosing may be appropriate some lines.

1.5 Automatic reclosing under out-of-step conditions should be prevent blocking relays.

1.6 Under-frequency load shedding relays should be coordinated so ensure system stability and integrity.

1.7 Protection applications, settings and coordination should be reviewed periodically and whenever major changes in generation, transmission, or operating conditions are anticipated.

The adequacy of the communication channels used for line and protections, should be assessed periodically. Automated channel monitors and failure alarms should be provided for protection communication channels if such failure can cause loss of generation, loss of load or cascading outages.

2. Each Member shall implement protection philosophy and preventive maintenance procedures that will improve their system reliability with the least adverse effect on the Interconnection. These procedures shall be provided to all relevant stat should specify when instruction and training are necessary. Each Member shall coordinate these procedures with any other Members that could be affected. These procedures should include:

2.1. Planning and application of protection schemes.

2.2 Review of protection schemes and settings.

2.3 Intended operation of protection schemes under normal, abnormal emergency conditions.

2.4 Testing and preventive maintenance of relays shall be scheduled at ref intervals, as well as other key protection equipment and associated components.

2.4.1 The operation of the complete protection scheme should be tested under conditions as close as possible to actual conditions.

2.4.2 The testing of communication channels between protection relays belonging to different Systems, should be carried out and the test results recorded.

2.5 Analysis of actual protection operation.

3. A prompt investigation should be made to determine the cause of abnormal protection performance and correct any deficiencies in the protection scheme.

4. Special Protection Systems (SPS):

4.1 The Control Centres shall monitor the status of each Special Protection System (SPS) and notify all affected Members of any change in status.

4.2 SPS should be designed for periodic testing without affecting the integrity of the protected System. They should normally achieve at least the same level of reliability as that provided by other protection schemes.

4.3 SPS should be designed with inherent security to minimize the probability of mal-operation, even with the failure of a primary component.

4.4 Each SPS should be reviewed periodically to determine if it is still required and if it will still perform the intended functions. Seasonal changes in power transfers may require changes in the SPS or its relay settings and the concerned Member shall then inform the other Members about the new settings

4.5 Every time an SPS operates, the incident should be reviewed and analyzed for correctness.

5. Prompt action shall be taken to correct the causes of mal-operation.

Background:

Protection greatly influences the operation of interconnected Systems, especially under abnormal conditions. Protection schemes used on the Interconnection for generator tripping and other remedial measures are of primary concern to the respective Members. However, the protection for internal use in a System often directly, or indirectly, affects adjacent Systems.

Special Protection Systems, also known as Remedial Action Schemes, are configurations designed to perform functions other than isolation of electrical faults, schemes are usually installed to maximize transfer capability. However, they may b, to maintain system or generator stability or to control active and reactive power flow critical components immediately following a disturbance, or to split a system or operate interconnection at preplanned locations to prevent cascading. The general design observed for any SPS shall be to perform its intended function(s) in a dependable manner and refraining from unnecessary operation. An SPS can expose a System to a greater re risk. The integrity of a whole System may depend on its correct operation.

E. MONITORING SYSTEM PARAMETERS:

Criteria:

Each System and Control Area shall continuously monitor those parameters (such , flow, MVAr flow, frequency, voltage, phase angle, etc.), internal and external to its System Control Area that indicates the condition of the Interconnection.

The Control Centres shall be provided with adequate equipment to accomplish its objective. Measuring instruments of suitable range and reliability for both norm emergency conditions shall be installed and maintained at strategic points.

Requirements:

1. Monitoring equipment shall be used to bring to the System Controller's attention of deviation from normal operating condition and to indicate, if appropriate, the necessary corrective action.

2. Each Control Area shall use sufficient instruments of suitable range, accurate sampling rate to ensure accurate and timely monitoring of the Interconnection's normal and emergency situations.

3. Control Centres shall monitor transmission line status, MW and MVAr voltages, Load Transfer Capability (LTC), settings and status of rotating and reactive resources.

4. Control Centres shall monitor system frequency.

5. Reliable instrumentation, including voltage and frequency meters with suitable range to cover probable contingencies shall be available in the Control Room.

6. Automatic oscillographs and other recording devices shall be installed at key locations and set to standard time to assist post-disturbance analysis.

7. Because of possible system separation, frequency information from several locations shall be monitored at the Control Centres.

8. Monitoring shall be sufficient, so that in the event of system separation, both the existence of the separation and the boundaries of the separated areas can be determined.

9. Transmission line monitoring shall be capable of evaluating the impact of losing any significant transmission or generation facility on the Interconnection both inside and outside the Control Area.

10. Critical unmanned facilities shall be monitored for physical security.

11. Planned Outages of generation or transmission facilities shall be taken into account in the monitoring scheme.

12. Voltage schedules shall be coordinated from a central location within each Control Area and coordinated with adjacent Control Areas.

13. All tie-line SCADA metering between Control Areas, shall be available to all the Operating Members' Control Centres.

Background:

The System Controllers must have information available to them at all times so that they can accurately assess the status of the system under normal operating conditions, make the correct

decisions following the occurrence of a contingency and rapidly restore system integrity after a disturbance.

F. INFORMATION EXCHANGE – NORMAL SYSTEM CONDITIONS:

Criteria:

System conditions - Information concerning system conditions shall be transmitted other Control Centres as needed.

Requirement:

1. Each Control Area shall disseminate information on actual and scheduled interchanges, voltages, and Planned Outages that may have an adverse effect other Control Areas.

2. Control Centres shall notify other Systems of current or foreseen operating conditions that may affect the Interconnection reliability. Examples of operating conditions that may affect reliability are: critically loaded facilities, Planned and Forced Outages, the commissioning of new facilities, abnormal voltage conditions, new or degraded protective systems, Force Majeure and new or degraded communication channels.

Recommendation:

To ensure that communication networks are functioning properly and that timely exchange of information takes place, specific monitoring and testing procedures of communication facilities, should be developed, documented and implemented in every System.

16. INFORMATION EXCHANGE - DISTURBANCE REPORTING

Criteria:

Disturbance reporting: Disturbances or unusual occurrences which may jeopardize the operation of the Interconnection, that will result, or could result, in equipment damage or customer supply interruptions, shall be studied pro-actively and in sufficient depth to enable the Operating Members to take the appropriate measures to prevent such incidents. The facts surrounding a disturbance shall be made available to all Control Centres.

Requirements:

1. Major operating problems that could affect other Systems shall be reported as soon as possible to neighboring Systems. These could include loss of generation, of load or of facilities.

2. Large disturbances affecting two or more Systems shall be promptly analyzed by the affected Members.

3. Based on the magnitude and duration of the disturbance or abnormal occurrence, those Systems or Control Areas responsible for investigating the incident shall provide oral and if necessary, written reports.

Recommendations:

1. If an operating problem cannot be resolved quickly, the probable duration and cause should be reported.

2. The Control Centre experiencing a disturbance should provide a written preliminary report to the other Control Centres within fourteen (14) days.

3. When there has been a disturbance affecting the Interconnection, Member delegates to the Operating Sub-Committee, should make themselves available the System or Systems immediately affected, in order to assist in the investigation.

Background:

Other affected Systems must be kept informed of potential or actual operating problems. Disturbances that result in substantial customer interruptions attract news media. The event and its causes will also be of considerable interest to the Operating Members should be viewed by the Control Centres as a learning experience.

I. MAINTENANCE COORDINATION:

Criteria:

Each system shall establish schedules for inspection and preventive maintenance generation, transmission and protection facilities; as well as of its control, communication and other auxiliary systems. These maintenance and inspection schedules shall be coordinated with other Control Centres and Control Areas to ensure that the outage r does not violate the agreed upon reliability criteria.

Requirements:

1. Planned generator and transmission Outages that may affect the reliability of interconnected operations, shall be planned and coordinated (notification and cancellation at least twenty-four (24) hours in advance) between the affected Control Systems and Control Areas. Special attention shall be given to the request for pertinent studies. A Planned Outage shall be advised at least two (2) weeks in advance and confirmed in writing. Each Control Area must be advised of any return of equipment to service.

2. If mutually agreed between Members an unplanned outage may be convert planned outage, provided that the requesting member submits a document specifying the reason for the extended unplanned outage and the time period the equipment is returned to service.

3. Scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., shall be coordinated as required.

4. Scheduled outages of telemetering and control equipment and associated communication channels shall be coordinated between the affected systems and control areas.

5. Annual maintenance plans shall be coordinated between the effected members and submitted to the Operating Sub-Committee in October of the previous year.

GUIDELINE III: EMERGENCY OPERATIONS

A. INSUFFICIENT GENERATING CAPACITY:

A Control Area which experiences a shortage of generation shall promptly balance generation and interchange schedules to its load without regard to cost, to avoid excessive use of the assistance provided by interconnection frequency bias. The reserve inherent frequency deviation is intended to be used only as a temporary source of emergency energy, and is to be promptly restored to enable the interconnected Systems to withstand the contingency. A Control Area unable to balance its generation and interchange schedules its load shall shed sufficient load to ensure that its Area Control Error (ACE) is corrected.

A Control Area anticipating a shortage of generation, shall bring to service all available generation, postpone equipment maintenance, schedule energy purchases and prepare itself to reduce load.

Requirements:

1. Agreements between neighboring Systems or within the SAPP shall contain provisions for compulsory emergency assistance to Operating Members for periods not exceeding six (6) hours.

2. When a shortage of generation occurs, generation and transmission facilities should be used to the fullest extent practicable to promptly restore normal system frequency, and voltage, and return ACE to the performance criteria specified in Guideline I.E.

2.1. If Automatic Generation Control (AGC) has become inoperative, control shall be used to balance generation and scheduled interchange schedule load.

2.2 The deficient System shall schedule all available assistance that is required with as much advance notice as possible.

2.3 The deficient System shall use the assistance provided by the frequency only for the time needed to accomplish the following:

2.3.1 Load its operating reserve as fast as possible.

2.3.2 Analyze its ability to recover using only its own resources.

2.3.3 If necessary, determine the availability of assistance from other Members and schedule that assistance.

3. If all other steps prove inadequate to remedy the situation, the deficient system shall take immediate action that includes, but is not limited to the following:

3.1 Schedule all available emergency assistance from other Systems.

3.2 Implement manual load shedding.

4. Unilateral adjustment of generation to return frequency to the scheduled value by other Control Centres, beyond that supplied through frequency bias and new interchange schedules, shall not be attempted. Such adjustment may result in the transfer limits of the transmission facilities being exceeded.

Recommendations:

1. Generators and their auxiliaries should be able to operate reliably at abnormal voltages and frequencies.

2. Plant operators should be supplied with instructions specifying the frequency and voltage below which it is undesirable to continue to operate generators connected to the system.

2.1 Protection systems should be installed to automatically trip the generators at pre-determined high and low frequencies.

2.2 If feasible, generators should be separated with some local, isolated load still connected. Otherwise, generators should be separated carrying their own auxiliary load.

2.3 Identify and address the problems that could delay the restoration of the System.

3. Emergency sources of power should be available to facilitate safe shutdown, enable turning gear operation, minimize the likelihood of damage to either generating units or their auxiliaries, maintain communication channels and facilitate re-start.

Criteria:

If a transmission facility becomes overloaded or if voltage/reactive power levels are outside established limits and the condition cannot be relieved by normal means such as adjusting generation or service schedules, and if a credible contingency under these conditions would adversely impact the Interconnection, appropriate relief measures, including load schedules shall be implemented promptly to return the transmission facility to within established limits. This action shall be taken by the System or Control Area experiencing the problem if the System or Control Area can be identified, or by other Systems or Control Areas, appropriate, if that identification cannot readily be made.

Requirements:

1. If an overload on a transmission facility or an abnormal voltage/reactive power condition persists and is caused by another System, the affected System shall notify the neighboring or remote System of the severity of the overload or abnormal voltage/reactive conditions and request appropriate remedy.

2. If an overload on a transmission facility or abnormal voltage/reactive condition persists and equipment is endangered, the affected System may disconnect facility at risk. Neighboring Systems impacted by the disconnection shall be notified prior to switching, if practicable, otherwise, promptly thereafter.

3. Action to correct a transmission overload shall not impose unacceptable stress on internal generation or transmission equipment, reduce system reliability beyond acceptable limits, or unduly impose voltage or reactive burdens on neighboring Systems. If all other means fail, corrective action may require load shedding.

4. Systems shall take all appropriate action up to and including shedding of firm r in order to keep the transmission facilities within acceptable operating limits.

C. LOAD SHEDDING:

Criteria:

After taking all other remedial steps, a System or Control Area whose integrity is in jeopardy due to insufficient generation or transmission capacity shall shed customers rather than cause an uncontrolled failure of components making up the Interconnection.

Requirements:

1. When a severe under-frequency occurs, automatic load shedding shall be coordinated throughout the Interconnection together with other operations, such as generator tripping or isolation, shunt capacitor tripping and other automatic actions which occur during abnormal frequency or voltage conditions.

2. Automatic load shedding shall be in steps and initiated by one or more of the following parameters: frequency, rate of frequency decay, voltage level, rate of voltage decay or power flow. See table in Appendix III.A "Automatic Under Frequency Load Shedding in the SAPP".

3. If a System or Control Area is separated from the Interconnection and there is insufficient generating capacity to restore system frequency following automatic under-frequency load shedding, additional load shall be shed manually before re-synchronizing.

Recommendations:

1. Voltage reduction for load relief should be resorted to in the distribution networks. Voltage reductions on the sub-transmission or transmission system may be effective in reducing load; however, voltage reductions should not be resorted to on the high voltage transmission system unless the system has been isolated from the Interconnection.

2. In those situations where it will be beneficial, manual load shedding should be implemented to prevent voltage collapse or imminent separation from the Interconnection due to transmission overload.

D. SYSTEM RESTORATION:

Criteria:

After a system collapse, restoration shall begin as soon as possible, provided it can proceed in an orderly and secure manner. Systems and Control Areas shall coordinate their restoration actions. Priority shall be given to the auxiliary supply of power stations and of transmission sub-stations. Even though the restoration is to be expeditious, Control Centres shall avoid premature action to prevent another collapse of the System.

Requirements:

1. Each Member shall have a restoration plan:

1.1 Operating personnel shall be trained in the implementation of the plan. Such training should include simulation exercises, if practicable.

1.2 The restoration plan shall be updated, as necessary, to reflect changes in the power network and to correct deficiencies found from experience and during the restoration exercises.

1.3 Each Control Area shall identify interconnections with adjacent Control Are that may be used to restore power and obtain agreement for their use.

1.4 Telecommunication facilities needed to implement the plan shall periodically tested.

2. Following a disturbance in which one or more areas are isolated, steps should immediately be taken to return the system to normal:

2.1 The Control Centre shall determine the extent and condition of the isolated area(s).

2.2 The System Controller shall then take the necessary action to restore system frequency to normal, including adjusting generation, placing additional generators on line, or shedding load.

2.3 When voltage, frequency and phase angle permit, the Control Centre should re-synchronize the isolated area(s) with the surrounding area(s), prop notifying adjacent Systems of the size of the area being reconnected and capacity of transmission lines effecting the reconnection.

E. EMERGENCY INFORMATION EXCHANGE:

Criteria:

A System or Control Area that is experiencing or anticipating an emergency shall communicate its current and future status to neighboring Systems and Control Areas with the SAPP. Systems able to provide emergency assistance shall make known capabilities.

Requirements:

1. A System shall inform neighboring Systems and Control Areas within the SAPP , through pre-determined communication channels, whenever the following situations are anticipated or arise:

1.1 The System's condition is burdening other Systems or reducing the reliability of the Interconnection.

1.2 The System is unable to purchase capacity to meet its load and reserve requirements on a day-ahead basis or at the start of an hour.

1.3 The System's line loadings and voltage/reactive power levels are such that a single contingency could threaten the reliability of the Interconnection.

1.4 The System anticipates 8% or greater voltage reduction or appeals to the public for load reduction because of an inability to purchase emergency capacity.

1.5 The System has instituted 8% or greater voltage reduction or appeals to the public to reduce load or load shedding for system wide problems.

F. SPECIAL SYSTEM OR CONTROL AREA ACTION:

Criteria:

Because the facilities of each System may be vital to the secure operation of the Pool, Systems and Control Areas shall make every effort to secure the Interconnection. However, if a System or Control Area establishes that it is endangered by remaining interconnected, it may take such action as it deems necessary to protect its network.

If the Interconnection is split, abnormal frequency and voltage deviations may occur. To permit re-synchronizing, relief measures shall be applied by the System(s) causing the frequency and voltage deviations.

Requirements:

1. When an emergency occurs, a prime consideration shall be to safeguard the Interconnection. This will permit maximum assistance to the System(s) in trouble.

2. If an area is separated during a disturbance, interchange schedules between Control Areas or fragments of Control Areas within the separated area shall be immediately reviewed and appropriate adjustments made in order to facilitate restoration. Attempts shall be made to maintain the adjusted schedules whether generation control is manual or automatic.

Recommendations:

1. If abnormal levels or frequency or voltage resulting in a disturbance may become unsafe to operate the generators or their support equipment connected to the System, their separation or shutdown should be accomplished in a manner that minimizes the time frame required to re-synchronize and restore the System.

2. AGC should remain operative whenever possible.

F. CONTROL CENTRE BACK-UP:

Criteria:

Each Control Area shall have a plan to continue its operations in the event that its Control center becomes inoperable.

Recommendations:

1. When a member develops a plan to ensure continued operations in the situation when a Control Centre becomes inoperable, Guideline I should be taken into account to ensure that a Control Area does not become a burden to the other Systems.

1.1 If the Control Area has a back-up Control Centre, it should be remote from the main Control Centre.

1.2 Each Control Area should have communication equipment installed at its back-up Control Centre, capable of communicating with the key points of its own Control Area and with other Control Areas.

APPENDIX III. A:

UNDER-FREQUENCY LOAD SHEDDING SETTING OF ALL UTILITIES

AUTOMATIC UNDER-FREQUENCY LOAD SHEDDING IN THE SAPP

UTILITY	UNDER-FREQUENCY	% LOAD OF MAX DEMAND TO BE SHED	TIME DELAY

GUIDELINE IV: OPERATING. PERSONNEL

A. RESPONSIBILITY AND AUTHORITY:

Criteria:

Each System Controller shall be delegated sufficient status and authority to take any action necessary to ensure that the System or Control Area for which he is responsible, is operated in a stable and reliable manner.

Requirements:

1. Each Control Area and Control Centre shall provide its System Controllers with a clear definition of their authority and responsibilities.

2. Each Control Area and Control Centre shall advise the other Control Centres of the authority and responsibilities of its own System Controllers.

B. SELECTION:

Criteria:

Each Control Centre and Control Area shall select its System Controllers using criteria likely to promote reliable and safe operation.

Recommendations:

1. Personnel selected as System Controllers should be capable of directing other operating personnel in their own System, and, at the same time, working efficiently with their counterparts in other Control Centres.

1.1 A System Controller should have:

- a high level of intellectual ability and above-average reasoning capability especially when under stress;
- reasonable mechanical, electrical and mathematical aptitudes, communication, supervision and decision-making skills.

1.2 System Controllers should also be proficient in lower-level assignments.

2. To maintain an adequate level of capability and expertise in system operations each Control Area shall conduct:

2.1 Evaluation of the candidates against a fairly detailed job description.

2.2 Analysis of the candidate's past records and experience.

2.3 In-depth interview with each candidate.

2.4 Evaluation of intelligence, logical frame of mind, technical aptitude, mathematical and communications skills together with psychological fitness.

2.5 Educational and academic background.

2.6 Physical examination.

3. Establish a Grading Committee in each Control Area to evaluate/interview candidates and assess them against a detailed job description.

C. TRAINING:

Criteria:

Each System and/or Control Area shall provide its personnel with training that is designed to promote reliable and safe operation.

Requirements:

1. Each Control Area shall provide its System Controllers with guidelines to resolve those problems that can be caused by realistic contingencies and known restrictions on equipment.

2. Each System Controller shall be thoroughly educated and trained in the Control Area operating policies and in the basic principles of interconnected system operations outlined in these Operating Guidelines.

Recommendations:

1. Each System should implement a training program for its Control Centre personnel.

1.1 Training should include both classroom and on-the-job training.

2. Each System should consider training on power system simulator.

3. Each System should consider the list of items in Appendix IV.A for inclusion in their training program.

4. Each System should consider the simulation of unusual occurrences as part of their training program.

Background.

The increasing sophistication of Control Centres, which covers control equipment, instrumentation and data presentation techniques, plus the interconnection of adjacent Systems, requires careful selection and training of Control Centre personnel. Proper and quick action during an emergency, as well as minute-to-minute operation of a complex system, depends upon human performance. Each System Controller should be well qualified, adequately educated, mentally suited, and thoroughly conversant with the principles and procedures of interconnected system operations.

To operate a power system effectively, a System Controller must have a thorough understanding of the basic principles of electricity and since a power system consists of a variety of components, equipment and apparatus, a thorough understanding of their characteristics and how these devices integrate to form a system, is absolutely essential. The System Controllers should also be capable of supervising others, of good communication and of proper decision-making.

In anticipation of abnormal situations on the Interconnection, System Controllers should receive special training to increase their awareness and make them capable of quickly conveying key information to other Control Centres.

D. RESPONSIBILITIES TO OTHER OPERATING GROUPS:

Criteria:

The operating personnel of each System and Control Area shall be responsive to requests for information emanating from other Systems or Control Areas and from the Operating Sub-Committee.

Requirements:

The operating personnel of Systems and Control Areas shall be aware of the operating information required by other Systems or Control Areas.

Background.

A key element of good system operation is the efficient transfer of information to o operating personnel in the SAPP during normal and emergency conditions.

APPENDIX IV.A: SUGGESTED ITEMS FOR INCLUSION IN THE TRAINING COURSE OF SYSTEM CONTROLLERS

This Appendix lists the items that should be included in a training course for System Controllers.

A. NORMAL OPERATIONS:

1. Basics of Power Flows:

    1.1 Alternating Current (AC):

        1.1.1 Generation
        1.1.2 Transmission
        1.1.3 Transformation
        1.1.4 Loads and effect on system
        1.1.5 Phase angle
        1.1.6 Phase shifting transformers
        1.1.7 Reactors
        1.1.8 Capacitors
        1.1.9 Parallel flows

    1.2 Direct Current (DC):

        1.2.1 Transmission
        1.2.2 Interconnections

2. Voltage Control

    2.1 Load characteristics
    2.2 Standards
    2.3 Schedules
    2.4 Causes for voltage deviations
    2.5 Generation excitation
    2.6 Transformer taps
    2.7 Reactive sources, e.g.

        2.7.1 Generators
        2.7.2 Synchronous condensers
        2.7.3 Capacitors
        2.7.4 Reactors
        2.7.5 Static Var compensators

3. Concepts of Active Power Control

    3.1 Operating Reserve
    3.2 Dispatching techniques

3.3 Generators AGCs and Govemors
3.4 Area Control Error (ACE)
3.5 Interchange control
3.6 Inadvertent interchange
3.7 Special operating program(s)

4. Economic Operation:

4.1 Dispatching techniques
4.2 Heat rates
4.3 Fuel costs
4.4 Start-up and shutdown costs
4.5 Pumped storage costs
4.6 Unit commitment
4.7 Economic loading
4.8 Effects of Transmission losses
4.9 Reactive flows
4.10 Utilization of limited energy capacity
4.11 Pumped storage capacity
4.12 Incremental and detrimental costs
4.13 Accounting procedures

5 Operating Guidelines and Constraints:

5.1 Operating Manual
5.2 Operating Guidelines
5.3 Control Performance
5.4 Criteria Reliability Criteria for Interconnected Systems Operation
5.5 Contingency assessment:

5.5.1 Generator outages
5.5.2 Transmission line outages
5.5.3 Transformer outages
5.5.4 Busbar Outages
5.5.5 Combination of above
5.5.6 Outages of reactive energy sources

5.6 Equipment capabilities and limits:

5.6.1 Thermal
5.6.2 Voltage/Reactive
5.6.3 Relay
5.6.4 Stability

5.7 Reserve requirements (special)
5.8 Time error and frequency
5.9 Voltage
5.10 Switching - voltage and redistribution of power flows

6. Operating Considerations:

6.1 Safety of personnel and equipment
6.2 Synchronizing
6.3 Line switching and clearance
6.4 Ferro resonance
6.5 Metering failures
6.6 Maintenance scheduling criteria:

6.6.1 Generation
6.6.2 Transmission
6.6.3 Substation
6.6.4 Protection

B. ABNORMAL OPERATIONS:

1. Dynamic Performance of System:

1.1 Transient stability
1.2 Oscillations
1.3 Relay action
1.4 Control-initiated swings
1.5 Causes of disturbances
1.6 Special Protection Systems (SPS)

2. Dynamic Performance of Equipment

2.1 Governor Response
2.2 Exciter response
2.3 Relays and breakers
2.4 Under-frequency relays
2.5 Metering
2.6 Automatic controls

2.6.1 Plant
2.6.2 AGC
2.6.3 Voltage
2.6.4 Generator and load tripping
2.6.5 System separation

2.7 Special Protection Systems (SPS)

3. Recognition of Abnormal Conditions:

3.1 Loss of load
3.2 Breaker operation
3.3 Line fault
3.4 Generator trip
3.5 Frequency deviation
3.6 Interchange deviation
3.7 Voltage level
3.8 System separation
3.9 Communication with power stations, substations and other utilities

3.10 Parallel flows

4. Remedial Action:

4.1 Islanding
4.2 Load shedding
4.3 Generator dropping/trips
4.4 Shifting generation
4.5 Switching generation
4.6 Isolated system operation
4.7 High- and low-frequency operation
4.8 High- and low-voltage operation

5. Recovery

5.1 Generation start-up capabilities and pickup rates
5.2 Sectionalizing Load pickup priorities and problems
5.3 Synchronizing within a System and at the Points of Interconnection

C. COMMUNICATIONS:

1. Facilities Available:

1.1 Common power line carrier schemes
1.2 Private microwave systems
1.3 Radio Emergency power supplies
1.4 Satellite communication systems

2. Information Exchange:

2.1 Standard terminology
2.2 Neighboring Systems
2.3 Power plants
2.4 Substations
2.5 Management
2.6 News Media
2.7 Governmental agencies

D. INTERCONNECTED SYSTEM OPERATIONS

1. SAPP Operating Criteria and Guidelines:

2. Philosophy of Operation:

2.1 Benefits
2.2 Obligations
2.3 Responsibilities
2.4 Authority

3. Effects on System Performance:

3.1 Frequency
3.2 Interchanges
3.3 Reserves
3.4 Mutual assistance
3.5 Pooling arrangements
3.6 Communications

4. Abnormal Operations:

4.1 Responsibilities
4.2 Actions required

E. MODERN POWER SYSTEM CONTROL AIDS

1. Equipment

1.1 Man-machine interface
1.2 Supervisory control
1.3 Data acquisition
1.4 Fail over and restart

2. Theory and use of Software Applications for Normal and Emergency Conditions

2.1 Interaction of software results on Systems and other programs
2.2 Effects

3. Alternative Control Methods during Equipment and Software Unavailability.

4. Typical Software Applications:

4.1 Economic dispatch
4.2 AGC
4.3 Unit commitment
4.4 Operator load flow
4.5 Contingency analysis

4.6 Corrective strategies
4.7 State estimation
4.8 Interchange accounting
4.9 Transmission evaluation
4.10 Automated billing

F. SUPERVISORY SKILLS

1. Personnel supervision
2. On-the-job training, preparation of
3. Verbal communication
4. Decision-making
5. Influence of stress

GUIDELINE V: OPERATIONS PLANNING

A. NORMAL OPERATIONS:

Criteria:

Each Control Area shall plan its future operations in co-ordination with other affected Con Areas to ensure that normal operation on the Interconnection proceed in an orderly, efficient manner.

Requirements:

1. Each Control Area shall schedule its plant and interchanges so as to meet the d load pattern and the changes in load characteristics.

2. The results of studies dealing with the operation of the System shall be available the System Controllers.

Recommendations:

1. Periodic reviews should be conducted with planning engineers to ensure that long-term plans comply with the SAPP Operating Guidelines.

2. A Control Centre should participate in the studies conducted by other Control Centres when:

2.1 The facilities in a System may affect the operation of the Interconnection.

2.2 The operating conditions impose restrictions on generating facilities

2.3 It is necessary to know the operating limitations on the system when transmission facilities are in service.

2.4 It is necessary to know the operating limitations on the system when transmission facilities are scheduled or forced out of service.

2.5 Voltage and reactive power schedules are likely to be restricted.

3. Studies should be made at least annually (or at such times as system changes warrant) to determine the transfer capability between Control Areas.

4. The determination of generating capability should take into account.

5. Each Control Area should determine the power transfer capabilities of its transmission system and identify potential problems by conducting simulation studies.

5.1 Thermal and stability limits, previous short- and long-term loading, voltage limits and seasonal (temperature) characteristics should be considered when determining the capability of transmission facilities.

5.2 Transfer capability studies should consider voltage, reactive, thermal, and stability limits of internal and external system equipment. (Ref: "Transfer Capability"); Generating unit and transmission facility outage patterns should be considered. Studies should determine the additional reactive power that is required under reasonable generating and transmission contingencies.

6. Computer models and data utilized for analyzing and planning system operations should be updated and replaced as necessary to ensure that they can accurately and adequately represent the System. The same software and computer platforms should be used throughout the SAPP. (It is recommended to move away from main frame computers to personal computers).

7. Neighboring systems should use uniform line identifiers and ratings when referring to transmission facilities being part of an interconnected network.

B. PLANNING FOR SHORT- TERM EMERGENCY CONDITIONS:

Criteria:

A set of contingency plans consistent with SAPP Operating Guidelines (particularly Guideline Ill) shall be developed, maintained and implemented to enable the Systems and Control Areas to cope with operating emergencies. These plans shall be coordinated with other Systems and Control Areas as appropriate.

Requirement:

1. Plans developed and maintained to cope with operating emergencies shall include procedures that can be executed by System Controllers.

Recommendations:

1. Appropriate Governmental agencies should be informed about these plans.

C. PLANNING FOR LONG-TERM EMERGENCY CONDITIONS:

Criteria:

Each System and Control Area shall maintain comprehensive and coordinated procedures to deal with long-term capacity or energy .deficiencies.

Recommendations:

1. The SAPP should develop capacity and energy emergency plans that will enable to reduce, to the fullest extent possible, the impact of a capacity or energy shortage on its customers.

2. Appropriate governmental agencies should be appraised of the plans.

3. If existing interchange agreements cannot be implemented, new agreements providing for emergency capacity or energy transfers, should be prepared.

4. The energy emergency plan should include or consider the following items:

- 4.1 Coordination with neighboring Systems.
- 4.2 An adequate plan of fuel inventory that recognizes reasonable delay problems in the delivery or production of fuel.
- 4.3 Fuel switch-over and removal of environmental constraints for generation units and other facilities.
- 4.4 The reduction of the System's own energy use to a minimum.
- 4.5 Appeals to the public through the media for voluntary load reductions energy conservation including educational messages on how to accommodate such load reduction and conservation.
- 4.6 Load management and voltage reductions.
- 4.7 The operation of all generating sources so as to save the fuel which short supply.

4.8 Appeals to large industrial and commercial customers to reduce essential energy use and maximize the use of customer-owned generation that relies on fuels other than the one in short supply.

4.9 Request appropriate Government Agencies to direct programs that will save energy.

4.10 A mandatory load curtailment plan will be used as a last resort. This plan should preserve the loads essential to the health, safety, and welfare of the community.

4.11 Notify appropriate Government Agencies as the various steps of the emergency plan are implemented.

4.12 Notify cogenerators and independent power producers to maximize availability and output.

5. The capacity emergency plan should address the following items:

5.1 Coordination with neighboring Systems.

5.2 Plans to seek removal of environmental constraints that reduce the capacity of generating units.

5.3 The reduction of the System's own energy consumption to a minimum.

5.4 Implementation of load management as appropriate.

5.5 The operation of all generating sources to maximize output and availability.

5.6 Appeals to large industrial and commercial customers to reduce nonessential energy use during peak and standard hours and maximize any customer-owned generation.

5.7 Use interruptible and curtailable customer loads to reduce capacity requirements.

5.8 Request appropriate Government Agencies to direct programs that will reduce capacity requirements.

5.9 A mandatory load curtailment plan will be used as a last resort. This plan should preserve the loads essential to the health, safety, and welfare of the community.

5.10 Notify co-generators and independent power producers to maximize availability and output.

6. Every System and Control Area should participate in the co-ordination of capacity and energy emergency plans and offer all possible assistance during , emergencies. The following steps should be taken:

6.1 Establish and maintain reliable communications between Systems.

6.2 If a capacity or energy emergency is foreseen, contact neighboring System as far in advance as possible to assess regional conditions and arrange all the relief that is available or necessary.

6.3 Coordinate transmission and generation maintenance schedules maximize capacity available or to conserve the fuel in short supply, includes cooling water or water for hydro stations.

6.4 Arrange deliveries of electrical energy from remote Systems through nor channels.

6.5 Continue to assess the level of generating capacity available and of energy supply and forecast future needs.

Criteria:

Each System and Control Area shall establish a program of manual and automatic load shedding which is designed to arrest frequency or voltage decays, or extreme power flows that could result in an uncontrolled failure of components of the Interconnection. program shall be coordinated throughout the Interconnection to prevent excessive transmission loadings and voltage deviations.

Requirements:

1. Each System shall establish plans for automatic load shedding and System Controllers shall have the authority to implement manual load shedding whenever necessary.

1.1 Load shedding plans shall be coordinated with those of other Members.

1.2 Automatic load shedding shall be initiated as soon as system frequency voltage has declined to a level agreed upon beforehand.

1.2.1 Automatic load shedding shall be carried out in steps and in function of one or more of the following parameters: frequency, rate of frequency decay, voltage level, rate of voltage decay or power flow levels.

1.2.2 The amount of load shed in each step shall be calculated to minimize the risk of uncontrolled separation, loss of generation, or system shutdown.

1.3 Automatic load shedding shall be coordinated throughout the SAPP with under-frequency isolation of generating units, tripping of shunt capacitors or any other automatic action that will occur under abnormal frequency, voltage, or power flow conditions.

Recommendations:

1. Automatic load shedding plans should be based on system dynamic performance where the greatest probable imbalance between load and generation is simulated.

1.1 Plans to shed load automatically should be analyzed to ensure that no unacceptable over-frequency, over-voltage or transmission overload will occur.

1.1.1 If over-frequency is likely, the amount of load shed should be reduced or automatic over-frequency load restoration should be provided.

1.1.2 If over -voltages are likely, the load shedding program should be modified to minimize that probability.

2. When scheduling an automatic load shedding operation, the System Controllers should consider the needs of their own Control Area or Utility as well as the capabilities of the interconnectors.

3. A generation-deficient Control Area may establish an automatic isolation plan in lieu of automatic load shedding, if by doing so it removes the burden it has imposed on the Interconnection. This isolation plan may be implemented only with the consent of neighboring Systems and if it leaves the Interconnection intact.

4. Each System and Control Area should consider isolating its generators to protect them from extended abnormal voltage and frequency conditions.

Criteria:

Each System and Control Area shall develop and periodically update a plan to restore electric network in a stable and orderly manner in the event of a partial or total shutdown. This plan shall be coordinated with other Control Areas to ensure a consistent restoration of the Interconnection.

A reliable and adequate source of black start power shall be provided. Where the sources are remote from the generating units, instructions shall be issued to expend availability. Steps to restore generation shall be verified by real life testing whenever possible.

Requirements:

1. Each System and Control Area shall establish a restoration plan with adequate operating instructions and procedures to cover emergency conditions, including loss of vital telecommunication channels.

1.1 Restoration plans must be developed with the intent of restoring the inter of the Interconnection.

1.2 Restoration plans shall be coordinated with neighboring Systems.

2. System restoration procedures shall be verified by real life testing and simulation.

Recommendations:

1. Where an outside source of power is necessary for starting up generating un switching procedures should be pre-arranged and periodically reviewed with System Controllers and other operating personnel.

2. Periodic tests should, where possible, be carried out to verify black-start capability.

3. In order to systematically restore loads without overloading the rest of the system opening circuit breakers should be considered to isolate loads in blacked-out areas (i.e. sectionalize the "dead" system).

4. Load shed during a disturbance should be restored only when doing so will not have an adverse effect on the System or the Interconnection.

4.1 Load may be restored manually or by supervisory control only by direction.

4.2 Automatic load restoration may be used to reduce restoration time.

4.2.1 Automatic restoration should be coordinated with neighboring Systems and Control Areas.

4.2.2 Automatic restoration should not aggravate frequency excursions, overload tie-lines, or burden any portion of the Interconnection.

5. All synchronoscopes should be calibrated in degrees. Voltage angle differences at the points of re-synchronization should be communicated in degrees.

6. Re-energizing oil-filled pipe-type cables should be given special consideration, especially if loss of oil pumps could cause gas pockets to form in pipes or potheads.

7. The following should be considered when trying to maintain normal transmission voltage during restoration:

7.1 Remove shunt capacitors, switch-in shunt reactors or add small blocks of load to prevent excessive Ferranti effect when energizing long transmission lines or high-voltage cables at the end of a long, lightly-loaded system.

7.2 The capability of the generators to provide or absorb reactive power.

8. The Control Centres should know the re-synchronizing points and procedures. Procedures should provide for alternative course of action when there is a lack of information or loss of communication that would affect re-synchronizing.

9. Each power station should have written procedures for orderly start-up and shutdown of the generating units.

9.1 These procedures should be updated when required.

9.2 Exercises should be held periodically to ensure that plant operators are familiar with the procedures.

10. Each power station should have a source of emergency power to reduce the time required for restarting. Hydroelectric power stations should have built-in restarting facilities.

11. Back-up voice telecommunication facilities, including emergency power supplies and alternative telecommunications channels should be provided to ensure coordinated control of operations during the restoration process.

12. Control Centres using SCADA systems should consider providing master trip restoration points to each sub-station and power station high voltage yard to expedite restoration process.

13. Protection schemes should be in working order during the restoration; Re-polarization sources should be maintained during the process.

GUIDELINE VI: TELECOMMUNICATIONS

A. FACILITIES:

Criteria:

Each System and Control Area shall be equipped with adequate and reliable telecommunication facilities internally and with other Systems and Control Areas to ensure the exchange of information necessary to maintain the reliability of the Interconnection. When possible, redundant facilities using alternative routes and medium, shall be provided.

Requirements:

1. Reliable and secure telecommunication networks shall be provided within and between Systems and Control Areas.

2. Dedicated telecommunication channels shall be provided between a Control Centre and the Control Centre of each adjacent System.

3. All dedicated telecommunication channels should not require intermediate switching to establish communication.

4. Alternate and physically independent telecommunication channels should be provided for emergency use to back up the circuits used for critical data and voice communications.

5. Restoration services on critical telecommunications channels should be available twenty-four (24) hours per day, every day of the year.

6. Each Control Centre should be able to take control of any telecommunication channel for System Controller use when necessary.

Background:

In addition to internal System and Control Area telecommunication channels, telecommunication channels shall be installed on every interconnection linking the Member's Systems. These channels should provide adequate telecommunication capabilities during emergency situations, or when adverse operating conditions are imminent.

Criteria:

Procedures for Control Centre to Control Centre communications, shall be established to Systems and Control Areas to ensure that communications between operating personnel are consistent, efficient and effective during normal and emergency conditions.

Requirements:

Each Control Area shall provide the means to co-ordinate telecommunication between the Systems in the Control Area. This shall include the ability to investigate and recommend solutions to telecommunication problems within the Control Are, and with other Control Areas.

C. LOSS OF TELECOMMUNICATION:

Criteria:

Operating instructions and procedures shall be established by each Control Area to enable operations to continue during the loss of telecommunication facilities.

Requirements:

Each Control Area shall have written operating instructions and procedures to enable continued operations during the loss of telecommunication facilities.

PROCEDURE FOR REVISING THESE OPERATING GUIDELINES

INTRODUCTION

These Operating Guidelines shall be based on good logic, scientific reasoning and operating experience. The Guidelines shall be correct, practical and highly considered by all System Controllers. System Controllers shall contribute to the updates and development of the Guidelines to ensure a practical operator's perspective.

The operating policies embodied in the Guidelines shall leave an adequate margin for contingencies. The Directives of the Operating Sub-Committee shall be focused towards interconnected system operations and shall set the pattern for future SAPP and System policies.

The Operating Sub-Committee will continue to investigate the technical background supporting these Guidelines with the assistance of individual Members and through its own efforts. Any Member utility can recommend revisions to the Guidelines through its representation at the Operating Sub-Committee. ,

REVISION PROCEDURES

1. Any SAPP Member can recommend revisions to the Guidelines through its representative at the Operating Sub-Committee.

1.1 A revision may cover a portion of, or the whole of the Guideline.

1.2 The proposal for revision must be in writing, and must consider the content of the other Guidelines to ensure compatibility and consistency.

1.3 The proposed revision must indicate whether it is a Requirement, a Recommendation, or a Background item, why it is needed, and how it improves the operating policies.

1.4 The language of the revision shall agree with the purpose. That is, Criteria and Requirements are obligations, while Recommendations and Background statements simply describe good operating practices.

1.5 The person(s) preparing a revision should work with other Operating Members who will ensure that the revision is consistent with the language and format of the Guidelines.

2. The proposed revision shall be presented by an Operating Sub-Committee representative to the Operating Sub-Committee.

3. The Sub-Committee may vote on the revision directly, or refer it to one or more Work Groups for review or improvement

4. If the revision is referred to a Work Group and the Work Group believes a new or revision of a Guideline is needed, it will prepare a draft for the Operating Sub-Committee's consideration.

5. If the Work Group rejects the proposed revision, the Operating Member can appeal directly to the Operating Sub-Committee through its representative.

6. Guideline revisions may be approved by the Operating Sub-Committee for a "trial period". The duration of the "trial period" is one year unless stated otherwise by the Sub-Committee.

7. After a revision is presented to the Operating Sub-Committee and is accepted for further processing:

7.1 The revision shall be distributed to the Operating Members for comments.

7.2 The comments are forwarded to the appropriate Work Group.

7.3 The Work Group produces a revised draft, if necessary, after considering all the comments, and submits to the Operating Sub-Committee.

7.4 The Operating Sub-Committee votes on accepting this draft, and if accepted, re submit the document to the Members for final comments.

8. The adoption of amended or new Operating Guidelines requires the approval of the Operating Sub-Committee as indicated in the Agreement among Operating Members. (NOTE: One vote per Operating Member).

9. This document does not need to be re-submitted for signature by the Management Committee. The Management Committee must be informed in writing of the amendment.

10. All approved revisions shall be numbered in sequence.

Signatories:

IN WITNESS whereof the said Operating Members have hereto set their hands:

APPENDIX 1

CONTROL PERFORMANCE CRITERIA TRAINING DOCUMENT

This document provides the Survey Coordinator of the SAPP Control Area Performance Criteria with specific instructions to organize and report on the survey using forms contained in the document as Tables A, B and C of this document.

The Control Area may use one of two methods for reporting its control performance:

(1) 24-hour reporting, or
(2) monthly reporting.

With the first method, the Control Area measures its compliance to A1 and A2 criteria for a twenty-four (24) hour period selected at random each month by the Performance Sub-Committee Chairperson. With the second method, the Control Area continuously monitors its compliance to A1 and A2 criteria and reports its results at the end of each month. This training document explains both methods of reporting in detail.

1. AREA CONTROL ERROR

The basis for the calculation of control performance of a Control Area against the Control Performance Criteria (CPC) is the Area Control Error (ACE). The values of ACE to be used throughout the calculation should reflect an actual, unfiltered quantity as displayed to the System Operator in the control room, but obviously wrong values such as "spikes" due to telemetering error or other spurious influences should be excluded from the calculation.

2. CONTROL PERFORMANCE CRITERIA

There are two (2) measures of the performance of ACE: they are referred to as A1 (Zero Crossing) and A2 (L d Compliance as defined in Section 2.1.2). These measures provide the System Operator with a convenient visual indication of how well the Control Area has kept to a minimum accumulation of un-intentional inadvertent interchange.

The determination of A1 and A2 depend on whether the Control Area is operating under normal or abnormal (disturbance) conditions. In addition to the criteria for normal condition, there are two (2) additional criteria which apply during disturbance conditions and which establish bounds for system recovery. The following discussion expands the definitions of the criteria found in the Guidelines: "Control Performance Criteria" and defines the criteria under both normal and disturbance conditions.

SHORT TERM ENERGY MARKET AGREEMENT

Among

POWER TRADING CORPORATION OF INDIA,

NEPAL ELECTRICITY AUTHORITY,

BANGLADESH POWER DEVELOPMENT BOARD,

BHUTAN DIVISION OF POWER,

CEYLON ELECTRICITY BOARD

and

THE SOUTH ASIA COORDINATION CENTRE

1.0 INTRODUCTION:

1.1 The SAPP Management Committee has approved the development of a Short Term Energy Market ("STEM"). The STEM is an interim arrangement leading to the establishment of a SAPP Energy Spot Market.

1.2 Existing bilateral Agreements shall continue, including rates, terms and conditions, until expiration of such Agreements in accordance with provisions contained therein.

1.3 The Coordination Centre shall be responsible for the administration and coordination of the STEM.

1.4 Bids and offers shall be submitted to the Coordination and it shall match the bids and offers using an optimization process.

1.5 The Coordination Centre shall then publish the results of the optimization process.

1.6 Participants shall transmit energy and the Coordination Centre shall then issue invoices to the relevant Participants.

2.0 TERMS OF AGREEMENT:

2.1 The Parties by their signatures agree to participate in the STEM on the conditions and terms set out in this Agreement and the Book of Rules.

2.2 The Book of Rules contains the procedural guidelines to be followed in the STEM.

2.3 The Book of Rules forms an indivisible part of this Agreement and is subject to amendment in accordance with the procedures described therein.

2.4 This Agreement shall be effective from the date of signature of any three Parties to this Agreement provided however that the Coordination Centre is one of the three Parties.

2.5 Once effective, this Agreement shall endure until the development of a SAPP Energy Spot Market.

2.6 This Agreement shall be binding on the remaining Parties to this Agreement from the date of their signature hereto.

2.7 Participation in the STEM is also open to other Parties, not specifically mentioned in this Agreement, which have been duly approved by the SAPP Executive Committee.

2.8 The STEM Agreement shall be binding on duly approved Participants from the date of signing of the "Acceptance of Terms to Trade in STEM". {Refer to Addendum 11: Book of Rules]

2.9 Any Party, excluding the Coordination Centre, may withdraw from the Agreement by giving the other signatories 3 (three) months' calendar notice in writing. Any amounts owing in terms of the Agreement shall be settled on the last day of the notice period.

2.10 This Agreement has been negotiated in accordance with the principles of the SAPP Agreements. Any issue not covered by this Agreement shall be dealt with in accordance with SAPP Agreements. In case of conflict between the SAPP Agreements and this Agreement, this Agreement shall prevail.

3.0 CONFIDENTIALITY:

3.1 The Parties shall treat as confidential all information furnished in terms of this Agreement and will make no use of such information other than to fulfill its obligations in terms of this Agreement.

3.2 The Parties shall also cause its employees, agents and representatives to treat as confidential all information furnished in terms of this Agreement applying the same care as if protecting its own proprietary information.

3.3 The information may only be disclosed if required by law or if consented to in writing by the Parties, which consent will not be unreasonably withheld, particularly, without limiting the generality of the foregoing, if the consent is required by any Party to optimize its respective businesses and the performance thereof. If required by law, written notification shall be given of such disclosure.

4.0 INDEMNITY:

4.1 The Parties acknowledge that the Coordination Centre has no control over the operating systems, the dispatching of energy traded or the receipt thereof. As such, the Coordination Centre is indemnified against claims for damage or loss that other Parties to this Agreement may suffer as a result of the transmission of energy.

4.2 The Coordination Centre is, however, not indemnified against claims resulting from its failure to perform any obligations in terms of this Agreement.

5.0 LIABILITY:

No Party shall have any claim against any other Party for any damage or loss unless such damage or loss is occasioned by breach of Agreement or by negligence on the part of the other Party. Notwithstanding anything to the contrary herein contained or implied, any and all claims for damage or loss shall be limited to direct damages or loss and shall exclude indirect or consequential damages such as loss of production, loss of income or profit and loss of goodwill.

6.0 **ASSIGNMENT, CESSION AND DELEGATION**:

No Party shall be entitled to assign, cede, delegate or transfer any rights, obligations, share or interest acquired in terms of this Agreement, in whole or in part, to any other Party or person without the written consent of the remaining Parties to this Agreement, which consent shall not be unreasonably withheld or delayed.

7.0 **RELAXATION**:

No indulgence, leniency or extension of a right, which one of the Parties may have in terms of this Agreement, and which one Party ('the grantor') may grant or show to any other party, shall in any way prejudice the grantor, or preclude the grantor from exercising any of the rights that it has derived from this Agreement, or be construed as a waiver by the grantor of that right.

8.0 **WAIVER**:

A waiver at any time by a Party of some or all of its rights with respect to a default or with respect to any other matter arising in connection with this Agreement, shall not be deemed to be a waiver of a Party's right in any further default by the defaulting Party or with respect to any such other matter arising in connection with this Agreement thereafter.

9.0 **SEVERABILITY**:

The Parties agree that it will perform its obligations under the terms of this Agreement in accordance with all applicable laws, rules and regulations now or hereafter in effect. If any Clause in this Agreement is found to be illegal or unenforceable in any of the Party's Country, then the Parties shall take all possible steps to restructure this Agreement in such a manner that it will comply with provisions of such laws. In such event the remaining Clauses of this Agreement shall remain binding on the Parties.

10.0 **BREACH OF AGREEMENT**:

Should any Party, excluding the Coordination Centre, fail to comply fully with any of the conditions of this Agreement, other than the failure to pay any settlement amount in accordance with Chapter 4, Section 5.3 of the Book of Rules, the Coordination Centre shall be entitled to give the defaulting Party notice of such breach and if the defaulting Party fails to remedy the breach within 7 (seven) days after receiving such notification, or if circumstances justify it such other period as may be agreed between the Parties, the Coordination Centre may terminate the defaulting Party's participation in the STEM Agreement, without prejudice to any claim the Coordination Centre may have or for damages suffered by reason of such breach on the part of the defaulting Party.

Should the Coordination Centre fail to comply fully with any of the conditions of this Agreement, any Party shall be entitled to give the Coordination Centre notice of such breach and if the Coordination Centre fails to remedy the breach within 7 (seven) days after receiving such notification, or if circumstances justify it such other period as may be agreed between the Parties, the aggrieved Party may submit a formal complaint to the Operating Sub-committee for adjudication.

11.0 DISPUTE RESOLUTION:

11.1 In the event of any dispute or disagreement concerning the interpretation of this Agreement or arising out of the performance or non-performance of any provision hereof, the Parties to the dispute shall endeavor to resolve their differences amicably within 7 (seven) days of such dispute or disagreement arising.

11.2 Should the Parties to a dispute fail to reach agreement on the matter in dispute within the period specified in Clause 11.1 or such longer period as they may agree upon, then either Party

may, by written notice given to the other Party, refer the matter to the Operating Sub-Committee Chairperson to immediately refer the matter in dispute to the Management Committee for settlement.

11.3 The Management Committee shall endeavor to resolve and settle the matter in dispute within 15 (fifteen) days of referral thereof by the Operating Sub-Committee Chairperson. Should, for any reason whatsoever, the Management Committee fail to resolve the dispute or if either Party is not satisfied by the Management Committee's determination or ruling on the matter, the Management Committee shall, by written notice to the Parties concerned, refer the matter within 5 (five) days of the date of determination or ruling to the Executive Committee for hearing and final determination.

11.4 The Executive Committee shall endeavor to resolve and settle matter in dispute within 15 (fifteen) days of referral thereof by the Management Committee. Should either Party to the dispute be dissatisfied by the Executive Committee's determination or ruling on the matter then the dissatisfied Party shall notify the Executive Committee and the other Party accordingly, after which the Executive Committee shall formally declare a dispute and the provisions of Clause 12 shall apply.

12.0 ARBITRATION:

12.1 Within 15 (fifteen) days of the Executive Committee formally declaring a dispute in terms of Clause 11.4, each Party to the Dispute shall appoint its own arbitrator and notify the other Party of such appointee.

12.2 The two arbitrators so appointed by the Parties shall, within 10 (ten) days of their appointment, consensually appoint a third arbitrator who shall be the Chairman of an Arbitral Tribunal comprising all the three arbitrators. Should the two appointed arbitrators fail to agree on the choice of the third arbitrator then such third arbitrator shall be appointed by the Executive Committee acting on the advice of the Management Committee.

12.3 Arbitration proceedings shall be conducted in accordance with the ruling UNICITRAL Arbitration Rules or such other International Arbitration Rules as the Parties to the dispute may agree upon.

12.4 The Parties to a dispute shall choose the place for Arbitration and the law applicable to the arbitration proceedings, failing which the Arbitral Tribunal shall determine such place or law as the case may be.

12.5 The language to be used in arbitration proceedings shall be English.

12.6 The Arbitral Tribunal shall decide on and settle the matter in dispute in accordance with the principles of equity and natural justice, and shall notify the Parties to the dispute and the Executive Committee of its decision within 30 (thirty) days of the conclusion of the hearing of the matter.

12.7 The decision of the Arbitral Tribunal shall be by a simple majority of the three arbitrators, and such decision shall be final and binding on the Parties to the dispute.

12.8 The Party against whom the Arbitral Tribunal makes a decision or an award shall bear the full costs of the arbitration proceedings, including the fees of the arbitrators.

13.0 FORCE MAJEURE:

13.1 Force Majeure shall mean any overwhelming occurrence or event that could not reasonably have been foreseen, prevented or guarded against by a Party including but not limited to the following:

(a) war, whether declared or not, civil war, blockage, civil commotion, riots, revolution, insurrection or acts of sabotage;

(b) Acts of God or natural disasters such as violent storms, cyclones, earthquakes, tidal waves, floods, damage or destruction by lighting and droughts;

(c) explosions, fires and damage or destruction of machinery or installations;

(d) boycotts, strikes, lock-outs or other similar work stoppages by employees that are not caused by unreasonable actions on the part of a Party to this Agreement.

13.2 No Party to this Agreement shall be liable for failure to perform any of its obligations under this Agreement, except in relation to the payment of settlement amount, insofar as such failure or impediment in performance is attributed to or was occasioned by a force majeure event.

13.3 Relief from liability for non-performance on account of force majeure shall commence on the date upon which the Party seeking relief gives notice of the impeding event of force majeure being relied upon, and shall terminate on the date when the impediment ceases to exist. Provided that such Party shall be relieved from liability for non-performance of an obligation affected by an event of force majeure only, and not from any other obligation.

13.4 Force majeure events do not include shortage of cash or anything reasonably attributable to, or preventable by a Party's own actions.

14.0 NOTICES AND ADDRESSES:

14.1 The Parties choose as their domiciles their respective addresses specified in subclause 14.2 hereof, for all purposes arising out of or in connection with this Agreement, at which addresses all processes and notices arising out of or in connection with this Agreement, its breach or termination may be served upon or delivered to the Parties.

14.2 For the purposes of subclause 14.1 hereto, the Parties' respective addresses shall be:

14.3 All communication amongst the Parties and in respect of this Agreement shall be confirmed in writing between the Parties. Any other communication amongst the Parties, shall be in writing and addressed to the following chosen addresses or any other address that the Parties may agree after signature:

14.4 Any notice given in terms of this Agreement, shall be in writing and shall:

14.4.1 if delivered by hand be deemed to have been duly received by the addressee on the date of delivery;

14.4.2 if posted by prepaid registered post be deemed to have been received by the addressee on the day of receipt;

14.4.3 if given by telegram be deemed to have been received by the addressee 1 (one) day after dispatch;

14.4.4 if successfully transmitted by facsimile be deemed to have been received by the addressee one day after dispatch.

14.5 Notwithstanding anything to the contrary contained in this Agreement, a written notice or communication, actually received by one of the Parties from the other, including by way of facsimile transmission, shall be adequate written notice or communication to such Party.

15.0 ENTIRE AGREEMENT AND VARIATIONS:

This Agreement constitutes the whole agreement amongst the Parties and supersedes all prior verbal or written agreements or understandings or representations by or between the Parties regarding the subject matter of this Agreement, and the Parties will not be entitled to rely, in any dispute regarding the subject matter of this Agreement, on any terms, conditions or representations not expressly contained in this Agreement. No modification, variation of or addition to this Agreement will be of any force or effect unless reduced to writing and signed by or on behalf of the Parties.

Signatures

SHORT TERM ENERGY MARKET

SAPP

BOOK OF RULES

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CHAPTER 1:GENERAL

1. STEM energy contracts
2. Qualifying requirements to trade
3. Conditions to the STEM

SECTION 1: STEM ENERGY CONTRACTS

1.1 The STEM is a firm energy market.

1.2 The following energy contracts may be traded:

(i) Monthly energy contracts;

(ii) Weekly energy contracts;

(iii) Daily energy contracts; and

(iv) Hourly energy contracts.

SECTION 2: QUALIFYING REQUIREMENTS TO TRADE

2.1 All Participants must satisfy the following criteria to be able to trade in the STEM:

(i) Sign the relevant STEM Agreement;

(ii) Be part of a SAPP host Control Area to facilitate inter-control area transactions;

(iii) Lodge security to cover energy trading transactions;

(iv) Pay the necessary participation fees to the Coordination Centre; and

(v) Provide the Coordination Centre with a copy of Participant's central banks approval to trade in the STEM.

SECTION 3: CONDITIONS TO THE STEM

3.1 Long term bilateral Agreements between Participants will be given priority for transmission on the SAPP inter-connectors and will have the following priority order:

(i) Bilateral Agreements (in order of its maturity);

(ii) STEM monthly contracts;

(iii) STEM weekly contracts; and

(iv) STEM daily contracts.

3.2 All transactions shall be subject to the transfer constraints as verified by the Coordination Centre.

3.3 Each energy contract shall be regarded as a different product in the STEM, i.e. monthly energy contracts are traded as one product, weekly energy contracts as another and daily as another. Energy contracts are not to be mixed.

CHAPTER 2:DEFINITIONS

A **Bid** refers to an attempt by a Participant to purchase energy in MW at a specified price for a specific period from the Short Term Energy Market.

Bilateral agreement, refers to any current or future Agreement entered into by two parties and normally covers a period longer than a calendar year.

Bulletin Board, refers to a display (e.g. computer screen) utilized to advertise or communicate the status of bids and/or offers.

Business Day or **working day**, shall mean any day other than a Saturday, Sunday or Public Holiday as defined in the Operating Agreement Between Members and Operating Guidelines.

Daily Contract, means an agreement entered into by Participants for sale or purchase of energy for the duration of a minimum of a day (24 hours) or multiples thereof to a maximum of 365 days in any calendar day in a specific trading year.

Data transfer in this context shall mean confirmation and payments.

Energy refers to electrical energy.

Firm shall mean energy intended to be available at all scheduled times for the duration of the transaction.

Forward trading shall mean trading of any contract in the future, up to a calendar year in advance.

Hourly Contract means an agreement entered into by Participants for sale or purchase of energy for the duration of a minimum of one (1) hour or multiples thereof to a maximum of twenty-four (24) hours in any calendar hour in a specific trading year.

Main Agreement refers to the SAPP STEM Agreement to which this Book of Rules forms an indivisible part of.

Monthly Contract means an agreement entered into by Participants for sale or purchase of energy for the duration of a minimum of one (1) month or multiples thereof to a maximum of twelve (12) months in any calendar month in a specific trading year.

An **Offer** is the energy presented for sale, in MW at a specified price for a specified period, by a Participant to the Short Term Energy Market for acceptance, consideration and refusal.

Participant refers to the Parties to the Agreement as well as other Participants duly approved by the SAPP Executive Committee.

SAPP Agreements, refers to the "Inter-governmental Memorandum of Understanding" (Dated _____), "SAPP Agreement between Operating Members" (Dated _____) and "SAPP Operating Guidelines" (Dated _____) as amended and revised.

Settlement amount means that amount required to payoff specific contracted transaction between Participants, invoiced by the Coordination Centre.

Test keys means the exchange of signal words between banks and banks; and banks and its customers to verify the authenticity of data transfer.

Time shall mean _____ Time, which is GMT 0:00 HRS + __:00 HRS

Transfer Limits refers to the power transfer limit, expressed in MW, that a network between two specified points can sustain. This limit is subject to the constraints that may exist within the network at any given time.

Weekly Contract means an agreement entered into by Participants for sale or purchase of energy for the duration of a minimum of a week (seven days) or multiples thereof to a maximum of fifty -two weeks in any calendar week in a specific trading year.

CHAPTER 3: TRADING RULES

1.0 General information

- 1.1 Trading forms
- 1.2 Transfer capability
- 1.3 Bilateral trading schedules

2.0 STEM energy contracts

- 2.1 Monthly contracts
- 2.2 Weekly contracts
- 2.3 Daily contracts
- 2.4 Hourly contracts

3.0 Trading procedures for STEM

- 3.1 Communicating of bids and offers
- 3.2 Verification of bids and offers
- 3.3 Changing of bids and offers

4.0 Interim arrangement

5.0 Settlement data

6.0 Supply reductions

7.0 Imbalances

8.0 Wheeling

9.0 Line Losses

10.0 Obligations of the Coordination Centre

SECTION 1: GENERAL INFORMATION

The Participants shall submit to the Coordination Centre the following general information and information specific to the various energy contracts:

1.1 Trading Form

Each Participant shall submit the trading form to the Coordination Centre. The bids and offers for the trade of Monthly, Weekly and Daily contracts shall contain the following information:

(i) Specify buying or selling transaction;
(ii) Participants name;
(iii) Contact person;
(iv) Contact details;
(v) Type of Contract;
(vi) Trading Period;
(vii) Volumes of energy to be traded;
(viii) Prices required;
(ix) Applicable currency;
(x) Name, date and signatories;
(xi) Transaction reference number.

[See Addendum 1 for Trading Form & Addendum 2 for Reference Numbers of each Participant]

1.2 Transfer Capability

Each Participant's network must fall under the control of a host control area, presently the PGCIL control area; In order to operate the network under its control, the host control area must be aware of the following:

(i) Network constraints and transfer limits; and
(ii) Scheduled bilateral energy trade arrangements.

The host control area is therefore responsible for submitting the transfer limits for its prescribed control area to the Coordination Centre. The maximum daily transfer capabilities are determined by considering the Participant's specific system constraints. {The maximum values are those given in Addendum 4]. Each Participant shall inform the Coordination Centre whenever there are changes in transfer capabilities. [Examples of the Schedules to be submitted by each of the host control areas are given in Addendum 7]

1.3 Bilateral Trading Schedules

In terms of Section 1.2 above, the host control area shall be aware of the scheduled energy to be traded the following day, based on the prevailing bilateral Agreements. The host control area is therefore responsible for submitting the daily schedules for each of the bilateral Agreements that are administered under its area of control. [The maximum contractual energy trade covered by the appropriate bilateral Agreement is given in Addendum 4]

SECTION 2: STEM ENERGY CONTRACTS

A Participant has a choice of energy contracts that it may enter into. The contracts are differentiated in terms of the time periods. The contracts range from hedged-type contracts (monthly contracts) to more volatile hourly trading (hourly contracts). Depending on the

Participant's requirements and the perceived risks (e.g. price volatility), a Participant may construct a portfolio of energy contracts to meet its requirements. Details of the various energy contracts and the trading time lines are given below.

2.1 Monthly Contracts

(i) Volumes and prices remain the same for the duration of the specified month;

(ii) These contracts shall begin on the first hour and end on the last hour of a calendar month (i.e. a month begins on hour ending 01 :00 HRS of the first calendar day of the month and shall continue until 24:00 HRS of the last calendar day of the month);

(iii) Forward contracting, up to 12 (twelve) months in advance is possible; and

{iv) Bids and offers for a future trading month shall be submitted at least 2 (two) business days before the beginning of the following month.

Trading Time Line for Monthly Contracts

Any time before 09:00 HRS of the 2nd last working day of every month; Participants shall submit bids and offers to the Coordination Centre for future monthly contracts;

At 10:00 HRS on the 2"d last working day of every month; The market shall close and the Coordination Centre shall match the bids and offers for any future trading month; and

At 14:00 HRS on the 2nd last working day of every month; The Coordination Centre shall publish the results to all the Participants.

2.2 Weekly Contracts

(i) Volumes and prices remain the same for the duration of the specified week;

(ii) These contracts shall be9in on the first hour and end on the last hour of a calendar week (i.e. a week begins on the hour ending 01 :00 HRS on Monday and shall continue until 24:00 HRS on Sunday of the week);

(iii) Forward contracting, up to 52 (fifty-two) weeks is possible; and

(iv) Bids and offers for a future trading week shall be submitted at least 2 (two) working days before the start of the following week.

Trading Time Line for Weekly Contracts

Any time before 09:00 HRS of the 2"d last working day of every week; Participants shall submit bids and offers to the Coordination Centre for future weekly contracts;

At 10:00 HRS on the last working day before the following week; The market shall close and the Coordination Centre shall match the bids and offers for any future trading week; and

At 14:00 HRS on the last working day before the following week; The Coordination Centre shall publish the results to all the Participants.

2.3 Daily Contracts

(i) Volumes and prices may vary for different hours of the day;

(ii) These contracts shall start on the first hour and end on the last hour of a day i.e. a day starts on the hour ending (11 :00 HRS and shall continue until 24:00 HRS of the same day;

(iii) Forward contracting up to 365 (three hundred and sixty five) days is possible;
and

(iv) Bids and Offers for a future trading day shall be submitted at least 1 (one) day prior to trade.

Trading Time Line for Daily Contracts

Any time before 09:00 HRS, a day before trading; Participants shall submit bids and offers to the Coordination Centre for future daily contracts;

At 10:00 HRS, a day before trading; The market shall close and the Coordination Centre shall match the bids and offers for any future trading day; and

At 14:00 HRS, a day before trading; The Coordination Centre shall publish the results to all the Participants.

2.4 Hourly Contracts

(i) All unallocated bids and offers shall be available for hourly trade on the actual day, this excludes emergency supplies that are catered for in the bilateral purchase agreements;

(ii) Unallocated bids and offers shall be published on a Bulletin Board;

[An example of the format of the Bulletin Board is given in Addendum 8]

(iii) Transactions should be concluded 20 (twenty) minutes before the start of the trading hour to enable inclusion in SCADA systems.

SECTION 3: TRADING PROCEDURES FOR STEM

3.1 Communicating bids and offers

(i) Trading by facsimile:

Participants using facsimile to trade must use a standard trading form, which shall be sent to the Coordination Centre. This method shall only be allowed if the Internet and electronic mail options are not available. It is the duty of the Participant to confirm with the Coordination Centre that the contents being transmitted are legible.

(ii) Trading through the Internet:

Participants trading through the Internet must make use of its unique trading web page, dedicated for this purpose. This page shall not be accessible by any other Participant and shall be similar to the standard trading form.

The Web address is: _____

(iii) Trading by Electronic Mail:

Participants who prefer to trade by electronic mail must complete an electronic standard trading form, before remitting it to the Coordination Centre.

E-Mail address: _____

(iv) Use of an agent

A Participant that does not have access to the above modes of communication may use the services of an agent to trade. However, such an agent shall not be a Participant in the STEM. The Participant trading through an agent shall still be directly liable and accountable for any acts of commission and or omission pertaining to trade.

3.2 Verification of bids and offers

All Participants shall ensure that the information transmitted to the Coordination Centre, relating to its bids and offers are accurate and correct. The Coordination Centre shall confirm receipt of the Participant's submission by electronic mail between 09:00 HRS and 09:30 HRS.

The Coordination Centre shall use the subsequent 30 (thirty) minutes, before the market closes, to receive corrections of any errors in Bids and Offers submitted by the Participants. Participants shall re-submit its bids or offers where confirmation by the Coordination Centre is at variance to the Participant's submission, unless such an error emanated from the Coordination Centre.

In the event that a Participant disagrees with the published information, the Participant may notify the Coordination Centre, which shall withdraw or correct the bid or offer. Once the market has closed, a Participant shall not be allowed to withdraw its bid or offer and is unable to influence further the price of the energy.

Participants may change its original bids and offers subject to the pertinent deadlines as described above. The last submitted bid or offer should always supersede all previous bids or offers for that particular transaction.

SECTION 4: INTERIM ARRANGEMENT

Initially, offers shall be published first, followed by the submission of bids. This interim arrangement shall allow Participants to develop experience in the market. This interim procedure shall endure for a period of 3 (three) months from the commencement of the STEM or such extended period as approved by the Operating Sub-committee. Thereafter the period for submission of bids and offers shall close simultaneously.

Trading Time Line during the interim arrangement

09:00 HRS Participants shall submit system status reports, bilateral energy schedules and available transfer capacity limits for the following day. All offers shall be submitted to the Coordination Centre. Wheelers shall notify the Coordination Centre of any possible wheeling constraints.

10:00 HRS Receipt and content of Participants' submissions are confirmed by issuing electronic mail/facsimile to the Participants from the Coordination Centre.

10:30 HRS The market closes.

11:00 HRS The Coordination Centre publishes all the offers made. The offers are transparent to all future bidders and wheelers.

12:00 HRS Participants shall bid for energy at the price that they are prepared to pay.

13:00 HRS The Coordination Centre shall match the bids and offers using an optimization process [Addendum 6] taking into consideration the bilateral Agreements, latest system constraints and wheeling charges applicable.

14:00 HRS The Coordination Centre shall publish the volume and price results to all the successful Participants as well as unallocated offers and unmatched bids.

SECTION 5: SETTLEMENT DATA

All participants involved in the STEM in any given day shall notify the Coordination Centre, on the 1st working day following the delivery of the contracted energy, of all information pertaining to forced outages or other events that may impact final payments.

[See Addendum3 for notification example]

SECTION 6: SUPPLY REDUCTIONS

[See Chapter 4, Section 5.7: "Penalties associated with supply reductions"]

SECTION 7: IMBALANCES

Two scenarios may occur, namely:

(i) Inter Control Area Imbalances

Inter Control Area imbalances shall be dealt with in accordance to the SAPP Operating Guidelines i.e.- inadvertent energy and 10 (ten) minutes compulsory assistance; and

Emergency assistance after the 10 (ten) minute compulsory period shall be as published on the bulletin board through bilateral negotiations, or at SAPP Emergency Energy Rates.

(ii) Intra Control Area Imbalances

Intra Control Area imbalances shall be dealt with as prescribed by the host control area.

SECTION 8: WHEELING

The obligations to wheel shall be the same as specified in the Agreement Between Operating Members and the wheeling charges shall be in accordance with the latest SAPP ruling.

[See Addendum 5 for year _____ wheeling charges]

SECTION 9: LINE LOSSES

The Participant (seller) shall be responsible for the transmission losses.

SECTION 10: OBLIGATIONS OF THE COORDINATION CENTRE

The Coordination Centre shall:

(i) Make available all facilities required to administer the STEM;

(ii) Receive bids, offers, transfer constraints and other related information;

(iii) Optimize and allocate the bids and offers using relevant computer technology; and

(iv) Timely publish the allocated volumes and prices to the relevant Participants according to the agreed time lines.

CHAPTER 4: FINANCIAL RULES

1. Currency of bids and offers

2. Prices

3. Security Requirements

3.1 Lodging of security
3.2 Security requirements for different STEM contracts
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7. Auditing

7. Participation Fees
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9. Time diagram of Payment Procedure

SECTION 1: CURRENCY OF BIDS AND OFFERS

Offers, bids and the published settlement amounts shall be in either _____ or the United States Dollar (USD). A Participant offering energy for trade may stipulate a currency of preference for payment. The Dollar/_____ exchange rate used shall be the mid rate of the exchange rate as quoted by Reuters, downloaded from Reuters half an hour before the market close, i.e. 09h30 and published on the web page.

SECTION 2: PRICES

Energy shall be traded in increments of 1 MW (one megawatt) at United States cents per kWh or _____ per kWh.

SECTION 3: SECURITY REQUIREMENTS

The Coordination Centre shall open security accounts in its name at _____ Bank. It shall have 2 (two) security accounts, a USD account and a _____ account.

3.1 Lodging of Security

As security for the due payment of the settlement amounts, the Participant shall:

(i) deposit cash collateral in a securities account or,

(ii) furnish the Coordination Centre with a bank guarantee from a bank of good credit standing (backed by currency transfer guarantee from the central bank).

The value of the energy contracts shall be the value from the date of optimization of bids and offers until the date of payment of the settlement amount. All forms of security shall be held at _____ Bank and must be fully and freely convertible to either ___ or USD currency.

3.2 Security requirements for different energy contracts

The security requirements for trading in the STEM is specified for each contract as follows:

3.2.1 Monthly energy contracts

Security must cover all expected payments for a minimum of one month's trading based on the confirmation of trading notification.

3.2.2 Weekly energy contracts

Security must cover all expected payments for a minimum of one week trading based on the confirmation of trading notification.

3.2.3 Daily energy contracts

Security must cover the days trading based on the confirmation of trading notification.

3.3 Management of Security

3.3.1 The Coordination Centre shall open security accounts for the lodging of the individual Participant's security. It shall monitor and ensure that the required security amount is maintained. Liquidations and transfers from this account shall only be authorized by the Coordination Centre. Any interest accruing from this account will be credited to the Participant.

3.3.2 Payment of settlement amounts shall not be made from the security account. Should a draw down on the security occur, additional security shall be lodged with the Coordination Centre before any further trading may proceed.

3.3.3 The Coordination Centre shall adjust, based on the confirmation of trading notification for each Participant, the amount of security required. The Coordination Centre shall manage, facilitate and disqualify Participants from further trading, where applicable.

3.3.4 Participants shall ensure that sufficient security is lodged with the Coordination Centre before trading commences.

3.4 Withdrawal of security

Participants shall be entitled to withdraw the security lodged in terms of Section 3.1 during periods where it does not intend to trade provided however that no settlement amounts are owing by the Participant. The Participant shall provide the Coordination Centre with 7 (seven) days

notice of its intention to withdraw the security. Should a Participant elect to withdraw its security, any associated administrative costs shall be payable by the Participant.

The Participant shall, when applicable, notify the Coordination Centre of its intention to commence trading and that the necessary securities have been lodged.

3.6 Fidelity Insurance

The credit risk of the Coordination Centre shall be insured through an external insurer.

SECTION 4: INVOICING

4.1 Confirmation of Trading notification

The Coordination Centre shall issue a confirmation of trading notification to the Participants in the currency of the bids or offers (i.e. USD or ___). The confirmation shall be issued on the same day as the allocation of successful bids and offers. It represents a commitment to supply/receive a specified quantity of energy at an agreed price. The confirmation shall detail:

(i) Energy bought/sold;

(ii) Wheeling charges;

(iii) Exchange rate used;

(iv) Administration fee;

(v) Total cost and currency of payment.

[Refer to Addendum 9 for an example of the Confirmation of Trading]

4.2 Invoicing

The Coordination Centre shall issue invoices to Participants in the currency of the offer (i.e. either in USD or ___) on the fourth business day following the delivery of the contracted energy. The invoice shall indicate the actual energy traded at the agreed rates for a specific contract. It shall take into account the load reductions resulting from network constraints and shall include the appropriate penalties associated with the deviations. The invoice shall detail:

(i) Energy bought/sold;
(ii) Wheeling charges;
(iii) Exchange rate used;
(iv) Deviations, where applicable;
(v) Penalties for non-performance;
(vi) Total cost and currency of payment.

[Refer to Addendum 10 for an example of an invoice]

SECTION 5: SETTLEMENT

5.1 Settlement period

The Participant shall participate with the full obligation to pay for energy traded and the associated energy costs. The settlement amounts based on the invoices, shall be payable into the Coordination Centre's clearing account within 3 (three) business days of the issuing of the invoice. The invoice shall be issued on the fourth business day following the delivery of the contracted energy.

5.2 Availability of funds in the Clearing Account

Participants (buyers) shall ensure that sufficient funds are paid into the clearing account for the Coordination Centre to effect payment to the respective Participants (sellers). The payment date shall be the date on which the Coordination Centre instructs the bank to make payment from its clearing account to the respective Participants (sellers). Late payments by the Coordination Centre shall attract interest at the applicable US prime rate or __ prime rate (as quoted by ____ Bank) compounded daily.

5.3 Participants failure to pay settlement amounts

Should a Participant not provide sufficient funds in the clearing account or fail to settle amounts stipulated on the invoice within 3 (three) business day of the issuing of the invoice, the Coordination Centre shall be entitled to claim against the security lodged by the defaulting Participant.

The settlement amount shall attract interest, from the date of the invoice, at the applicable US prime rate or __ prime rate (as quoted by _____ Bank) compounded daily.

5.4 Procedure for claiming against the security

5.4.1 The Coordination Centre shall notify the defaulting Participant on the second business day following the issue of the invoice:

(i) that it intends to claim against the security provided on the second business day following the day of issue of the invoice;

(ii) that the Coordination Centre shall settle, from its own account, amounts owing by the defaulting Participant on the fourth business day following the issue of the invoice;

(iii) that any costs the Coordination Centre may incur as a result of the settlement shall be for the account of the defaulting Participant.

5.4.2 The Coordination Centre shall on the fifth business day following the issue of the invoice claim the following amounts against the security furnished by the defaulting Participant:

(i) the debt incurred by the Coordination Centre in the settlement of amounts owing by the defaulting Participant.

(ii) any additional costs it has incurred as a result of the settlement.

Further trading by the defaulting Participant will be suspended until the required additional security has been lodged.

5.5 Dispute on the Settlement amount

Should the Participant dispute a settlement amount, it shall not be entitled to reduce or set off its debt or defer payment thereof beyond the settlement period. The matter in dispute shall be addressed in terms of Clause 11 of the Main Agreement.

5.6 Incorrect invoicing

Should a Participant be incorrectly invoiced for the energy traded, the Coordination Centre shall as soon as practicable credit the Participant's account or reimburse the Participant with the total amount overcharged, or debit the Participant's account with the total amount undercharged. The amount debited shall be immediately due and payable.

The amount credited or debited shall include the interest from the date of the invoice, at the applicable US prime rate or __ prime rate (as quoted by _____ Bank) compounded daily.

5.7 Penalties associated with supply reductions

Should an event occur resulting in a reduction of the published supply of energy to be traded on the actual day of trade, the following shall apply to every hour or proportion thereof, in which the supply was interrupted:

(i) Where the Participant (seller) is unable to supply, wheeling costs shall not be payable and the Participant (seller) shall be invoiced by the Coordination Centre to pay a penalty equivalent to twice the transaction price for the energy the Participant (buyer) would have received. Participants shall only be required to provide security to cover the transaction price. In the event of a Participant (seller) being unable to supply and fails to pay the penalty, the Coordination Centre shall claim against the security provided and instruct the Participant (seller) to pay the balance to the other Participant (buyer). The Coordination Centre may suspend the Participant (seller) from further trading until the penalty amount is settled.

The outstanding amount shall attract interest, from the date of the invoice, at the applicable US prime rate or __ prime rate (as quoted by ____ Bank) compounded daily.

(ii) Where the wheeler is unable to wheel, wheeling costs shall not be payable and the transaction shall be omitted from the settlement amount.

(iii) Where the Participant (buyer) is unable to receive, wheeling costs shall not be payable however the Coordination Centre shall invoice the Participant (buyer) with the transaction price which shall still be payable.

Participants will not be entitled to claim damages in addition or in lieu of any penalties that may be payable.

SECTION 6: CLEARING ACCOUNT

The Coordination Centre shall open clearing accounts in its name at _____ Bank. It shall have 2 (two) clearing accounts, a USD account and a ___ account. The Coordination Centre shall also operate an overdraft facility.

6.1 Before trading commences:

(i) The Coordination Centre shall ensure that standing instructions are sent to and received from all the Participants. Standing instructions are the bank account details of all parties.

(ii) Test keys have been arranged with _____ bank to authorize payments to Participants' bank accounts.

6.2 Once trading commences:

6.2.1 Participants shall :

(i) effect payment of energy purchases into the Coordination Centre's clearing account from its resident bank accounts.
(ii) Ensure that the payments received from the Coordination Centre's clearing account are correct.

6.2.2 Coordination Centre shall :

(i) Reconcile payments made by Participants (buyers).

(ii) Instruct the bank to effect payment to Participants (sellers).

6.3 The Coordination Centre's daily settlement procedures

(i) Each Participant is supplied with confirmation of trading notification.

(ii) Events are recorded, and penalties are determined.

(iii) Invoices are sent to Participants.

(iv) The Participants (buyers) shall simultaneously instruct its local banks to effect payment to the SAPP clearing account.

(v) The Coordination Centre shall communicate with _____ Bank to effect payment to the Participants (sellers) according to the invoice.

(vi) The Coordination Centre shall reconcile payments to the Participants.

SECTION 7: AUDITING

An external auditor shall audit the Coordination Centre as part of its financial reporting requirements. The appointed auditors shall ensure that the financial functions performed by the Coordination Centre in the STEM shall comply with the Generally Accepted Accounting Practices.

SECTION 8: PARTICIPATION FEES

The Participant shall pay participation fees to the Coordination Centre in respect of actual and potential costs incurred by the Coordination Centre in providing a trading service. The composition of the participation fees is given below:

8.1 An annual subscription fee

A fee of US$ 15,000 (fifteen thousand United States Dollars) that shall be payable at the beginning of each year and irrespective of whether the Participant trades in the STEM. This fee shall not be pro-rated. It comprises:

(i) Personnel charges

(ii) Fidelity Insurance fees

8.2 An administrative fee comprised of the charges below:

The administrative fee shall form part of the Invoice and shall comprise:

(i) Charges payable to the institution appointed to administer the clearing service

(ii) Volume dependant trading fee

Should the Participant fail to pay the participation fees, the Coordination Centre may suspend further trading by the Participant. All participation fees shall be subject to annual review and adjustment by the Coordination Centre.

SECTION 9: TIME DIAGRAM OF PAYMENT PROCEDURE

TIME DIAGRAM OF PAYMENT PROCEDURE

Trading	Covers the period from the matching of offers and bids, confirmation of trading notification and includes the flow of energy for the different contracts.
Trading + 3 business day	Reconciliation of the actual energy traded
Trading + 4 business days	Invoice issued .
Trading + 5 business days	Payment of Invoice into the clearing account
Trading + 6 business days	Failure to pay Invoice. Notice to defaulting Participant. Coordination Centre settles amounts owing by defaulting Participant. Settlement amounts to be paid to other Participants.
Trading + 7 business days	Coordination Centre claims against security

CHAPTER 5:AMENDMENTS

5.1 As STEM is a new and developing market, the Book of Rules shall be modified, amended or revised as the market progresses.

5.2 The SAPP Operating Sub-Committee shall establish representative ad hoc working groups to investigate and recommend amendments to the Book of Rules.

5.3 The working group shall propose amendments of the Book of Rules to the SAPP Operating Sub-Committee for approval and adoption. The SAPP Operating Sub-Committee may modify, amend or revise all sections except those requiring approval by the SAPP Management Committee or SAPP Executive Committee.

5.4 Modifications, amendments or revisions to the following sections shall, in addition to the approval by the SAPP Operating Sub-Committee, require the approval of the SAPP Management Committee:

(i) Section 2.1 of Chapter 1;

(ii) Section 2 of Chapter 4;

(iii) Section 7 of Chapter 4;

(iii) Section 8 of Chapter 4.

5.5 Approval of amendments, modifications or revisions by the SAPP Operating Sub-Committee and SAPP Management Committee shall be in accordance with the rules of the SAPP Agreements (i.e. decisions will be made by consensus or failing this, by a two-thirds majority).

5.6 The accepted amendments shall be effective from the date of approval by the relevant committee. All energy contracts in existence at the time of the amendment shall continue on the terms and conditions applicable at the time the energy contract was awarded.

CHAPTER 6:ADDENDA:

ADDENDUM 1 STEM Trading Form

ADDENDUM 2 Reference Numbers

ADDENDUM 3 Settlement Data

ADDENDUM 4 Transfer Limits and Bilateral Agreements

ADDENDUM 5 Wheeling charges

ADDENDUM 6 Program Manager

ADDENDUM 7 Submissions by Host Control Area Operator :
Transfer limits and Bilateral Contract Energy Schedules

ADDENDUM 8 Bulletin Board

ADDENDUM 9 Confirmation of Trading

ADDENDUM 10 Example of STEM Invoice

ADDENDUM 11 Acceptance of Terms to Trade in STEM

Addendum 1

STEM TRADING FORM

SAPP Coordination Centre
(address, Tel. & Fax, e-mail)

OFFERS [SELL]

Participant Name:
Contact Person:
Contact Details:
Type of Contract: Daily
Trading Period: From: 06110/00 To 06110/00
Reference Number:

OFFERS [SELL]

Hour	Power (MW)	Price/KWh (US/__ Cents)*
1	100	1.83
2	100	1.83
3	100	1.83
4	100	1.85
5	100	1.83
6	100	2.36
7	100	2.36
8	100	2.36
9	100	2.63
10	100	2.63
11	100	2.63
12	100	2.36
13	100	2.36
14	100	2.36
15	100	2.36
16	100	2.33
17	100	2.33
18	100	4.70
19	100	4.70
20	100	4.70
21	100	2.67
22	100	2.21
23	100	2.21
24	100	2.21

Date: ..... Signed:.....

Confidentiality: The contents of this trading form are confidential and considered privileged and will not be communicated to any other party except as provided for in the Agreement between the Participant and the Coordination Centre.

*Delete where NOT APPLICABLE

ADDENDUM 2

REFERENCE NUMBERS

Reference numbers specific to transactions and participants

Contract Codes:

Day Contract:

UUU	S/B	D	X	d	XX	M	XX	y	XXXX
Utility code	sell/buy	contract Indicator i.e. day	Transaction number	day contract commences	day number [1;31]	month contract	month number [1;12]	year of contract	year number
3 digits	1 digit	1 digit	1 digit	1 digit	2 digits	1 digit	2 digits	1 digit	4 digits

Week Contract:

UUU	S/B	W	X	w	XX	y	XXXX	
		M		m	XX	y	XXXX	
Utility code	sell/buy	contract Indicator i.e. week	Transaction number	week contract commences	week number [1;52]		year of contract	year number
3 digits	1 digit	1 digit	1 digit	1 digit	2 digits	1 digit	4 digits	

Month Contract:

UUU	S/B	M	X	m	XX	y	XXXX	
Utility code	sell/buy	contract Indicator i.e. month	Transaction number	month contract commences	month number [1;12]		year of contract	year number
3 digits	1 digit	1 digit	1 digit	1 digit	2 digits	1 digit	4 digits	

Utility Codes:

PGCIL
NEA
CEB
BDP
BDPD

Day Contract:

PGCIL_S_D1_d1_2M10Y2000
This represents a day contract by PGCIL to sell energy on 12 October 2000; transaction 1.

Week contract:

NEA_B_W1_w42Y2000
This represents a week contract by NEA to buy energy in week 42 in 2000; transaction 1.

Month contract:

CEB_S_M2_m11Y2000
This represents a month contract by CEB to sell energy for the block period of one month and refers to month 11 (November) in 2000; transaction 2.

ADDENDUM 3

STEM SETTLEMENT DATA

(date)
SAPPCC transaction Number:
Participants: PGCIL, NEA, BDP, BDPD, CEB
FOR:

Hour Ending	Scheduled Transaction	Rescheduled Transaction	Penalty Seller	Penalty Buyer	Omitted Wheeler	Reasons
01:00	100	100	0	0	0	
02:00	100	100	0	0	0	
03:00	100	100	0	0	0	
04:00	100	100	0	0	0	
05:00	100	40	60	0	0	PGCIL unable to supply
06:00	100	100	0	0	0	
07:00	100	100	0	0	0	
08:00	100	100	0	0	0	
09:00	100	100	0	0	0	
10:00	100	60	0	40	0	NEA unable to receive
11:00	100	100	0	0	0	
12:00	100	100	0	0	0	
13:00	100	100	0	0	0	
14:00	100	100	0	0	0	
15:00	100	100	0	0	0	
16:00	100	100	0	0	0	
17:00	100	0	0	0	100	PDB unable to wheel
18:00	100	0	0	0	100	CEB unable to wheel
19:00	100	100	0	0	0	
20:00	100	100	0	0	0	
21:00	100	100	0	0	0	
22:00	100	100	0	0	0	
23:00	100	100	0	0	0	
00:00	100	100	0	0	0	
Totals	2,400.00	2100	60	40	200	

IN AGREEMENT WITH SETTLEMENT DATA (Date)

PGCIL
NEA
PDB
CEB
BDP

ADDENDUM 4

SYSTEM TRANSFER LIMITS AND BILATERAL AGREEMENTS

System Transfer Limits

From	To	Maximum Power (MW)
PGCIL		
NEA		
BDP		
PDB		
CEB		

Bilateral Agreements (Maximum Values)

From	To	Agreed Power (MW)
PGCIL		
NEA		
BDP		
PDB		
CEB		

ADDENDUM 5

Wheeling Charges

ADDENDUM 6

STEM Program Manager

1. Introduction

The Coordination Centre has been entrusted by the SAPP Operating Sub-Committee members to facilitate trade in the Short Term Energy Market (STEM). This addendum aims to explain the trading rules behind STEM that will be used in the matching of offers and bids taking into account the current bilateral agreements, system transmission constraints and wheeling charges payable to all wheelers. The proposed currency of trade is either the United States American Dollar or the _____.

2. Trading Rules

From the onset, the Coordination Centre had realized that before any meaningful trade in electricity could start, there should be trading rules that all member utilities should fully observe and support. With that in mind, the Coordination Centre proposed the following trading rules.

2.1 Allocation of offers

The allocation of offers to successful bidders would start with the cheapest offer available on the market. The cheapest offer would then be shared equally between all the successful bidders unless the bid power is less than the allocation and in which case the excess will be shared equally amongst the other remaining bidders. The above statements can be summarized into two simple rules as follows:

Rule 1: The cheapest power sells first, unless such sales would compromise system integrity.

Rule 2: Equal sharing of cheaper power to all the qualified bidders.

2.2 Wheeling Charges

The Centre proposed to publish the offer power and the corresponding offer price without any inclusion of the wheeling charges. It would then be the responsibility of the buyer to pay all the wheeling charges that would be applicable for each transaction. This is summarized as rule 3.

Rule 3: The Coordination Centre will publish all the offers received without the inclusion of wheeling charges.

The basis for Rule 3 is that the actual price that would eventually be paid by the bidder would depend on the bidder's geographical positive relative to the seller. The seller and the Coordination Centre have no idea of who the buyer would be and hence cannot predict the wheeling charges that would be applicable.

Rule 4: The buyer will pay all the wheeling charges.

2.3 Bidder Qualification Criterion

If a seller has advertised for P MW of power at the selling price of C^2 cents / kWh and the bidder is ready to buy power at the bidding price of Cb cents / kWh, then for the bidder to qualify for the advertised power Equation (1.0) must hold.

$$C^2 [1 + \text{Wheeling charge as a percentage}] \leq \$Cb \qquad (1.0)$$

Equation (1.0) will be referred to as the bidder qualification criterion and is stated as Rule-5:

Rule 5: The bidder qualifies to buy power from any offeror if the sum of the offer price and the applicable wheeling charges are less than or equal to what the bidder is prepared to pay.

2.4 Trading Procedure

The trading procedure to be followed by all the operating members is that outlined in the STEM document: Short Term Energy Market - Book of Rules.

Addendum 7

Submission by Host Control Area: Transfer Limits and Bilateral Contract Energy Schedules

SCHEDULED TRADE

PGCIL Control Area
Date:

A. Transfer Limits

From	To	Hr	1	2	3	4	5	6	7	8	… 24
PGCIL	NEA	MW	100	100	100	100	100	100	100	100	… 50
PGCIL	BDP	MW	100	100	100	100	100	100	100	100	…
50 PGCIL			PDB	MW	100	100	100	100	100	100	100
100	…	50 PGCIL			CEB	MW	100	100	100	100	100
100	100	100	…	50							

B. Trade between PTC/PGCIL and Following Utilities:

NEA	Hr	1	2	3	4	5	6	7	8	… 24
	MW	20	20	20	20	20	20	20	20	… 20
BDP	Hr	1	2	3	4	5	6	7	8	… 24
	MW	20	20	20	20	20	20	20	20	… 20
PDB	Hr	1	2	3	4	5	6	7	8	… 24
	MW	20	20	20	20	20	20	20	20	… 20
CEB	Hr	1	2	3	4	5	6	7	8	… 24
	MW	20	20	20	20	20	20	20	20	… 20

ADDENDUM 8

BULLETIN BOARD

Date: ____

		OFFER			BID		
Hour	Participant:	MW	Currency	Price	MW	Currency	Price
1	PGCIL				50	INR	3.0
1	NEA	100	US cents	3	50	INR	3.0
8							
8							

ADDENDUM 9

CONFIRMATION OF PRICE

Trading Date:
Seller:
Buyer:

Customer:
Confirm Date:
Order No:
Contract Type: Daily

Date	Exchange Rate	Qty (MW)	Description	Unit Price (US cents/kW)	Duration	Total ($)

Payment Details: Bank Transfer
SAPP Bank Details:
Account Numbers:

The currency of payment for this transaction is the _____.

ADDENDUM 10

EXAMPLE OF INVOICE

ADDENDUM 11

ACCEPTANCE OF TERMS OF TRADE IN STEM

I,.....in my capacity as..... representing..... and duly authorized hereto, by my signature bind .....as a Party to the South Asia Power Pool Short Term Energy Market Agreement. I accept the terms and conditions contained in the Agreement and the Book of Rules attached thereto.

I confirm that.....shall adhere to the rules and principles pf SAPP Agreements to the extent that it has relevance to the Short Term Energy Market.

Signed at. . . . . .

on this.....day of.....

_____

Signature

As Witnesses:

1.....

2.....

(Signatures of existing Parties to the Agreement to follow)

Appendix D Regional Power Exchange - Exemplary Power Trade Agreements (India & Nepal; SAPP)

There has been a decade of cooperation between India and Nepal involving cross-border power transfer and trade. This cooperation was established through the Power Exchange Committee, created in 1992, and carried out under the Power Trade Agreement (executed in 1997, pending ratification by Nepal). One approach (**Annex 5.1**) to consider is to implement the regional interconnections recommended in the Four Borders Report by amending the existing agreements between Nepal and India to include power transfer and trade with Bhutan and Bangladesh. The following is a re-draft of the 1997 Power Trade Agreement that incorporates the terms of reference of the Power Exchange Committee for carrying out regional power trading activities.

As a further example of how regional power trade has been established through a memorandum of understanding, **Annex 5.2** includes, as a second exemplary agreement, a draft MOU, based on the Inter-Governmental MOU executed by the twelve countries that established the South Africa Power Exchange.

5.1 Memorandum of Understanding Concerning Regional Electric Power Trade

WHEREAS, His Majesty's Government of Nepal (hereinafter "HMGN"), the Government of India ("GOI"), the Government of Bhutan ("Bhutan") and the Government of the People's Republic of Bangladesh ("GOB") desire to further promote and strengthen the friendly relations existing among them;

WHEREAS, each country has adopted policies of economic liberalization with the intention to promote participation of the private sector in the development of their respective countries;

WHEREAS, each country has emphasized quicker and enhanced development of the power sector through participation of local and foreign private investors in the power industry of their respective countries;

WHEREAS, each country envisage the development of a number of power projects within the foreseeable future in their respective countries; and

WHEREAS, each country, in view of the upcoming power projects in their respective countries have held mutual discussions and have reached an understanding that this Agreement shall facilitate the process of electric power trade among the countries in the region.

NOW, THEREFORE, THE PARTIES HAVE AGREED AS FOLLOWS:

ARTICLE 1

Any party, in Nepal, India, Bhutan or Bangladesh, may enter into an agreement for power trade in the region irrespective of such parties being Governmental, semi-Governmental or private enterprise.

ARTICLE 2

The parties entering into such an agreement for power trade may determine the terms and conditions of such an agreement, including the quantum and parameters of supply, the points of delivery and the price of supply of electrical power to be traded among them.

Such determinations shall be made with the support of a Regional Power Exchange Committee having the following terms of reference: (i) examine adequacy of existing transmission links between countries and propose additional regional links; (ii) examine means of implementing and funding of additional regional transmission links; (iii) monitor progress of regional transmission links under construction and relate to proposed additional regional links; (iv) examine existing tariffs in relation to the actual cost of generation and transmission; (v) recommend principles applicable to regional power trade and transfer that promote an integrated and optimal operations of the different transmission systems for long term power, temporary power supply, seasonal power supply, emergency power supply and restricted power supply (peak and non-peak).

ARTICLE 3

The parties entering into such an agreement for power trade shall be afforded all necessary assistance by respective Governments, in accordance with the laws and regulations of respective countries, for conduct of surveys including field investigations and for the construction, installation, operation and maintenance of facilities required for generation and transmission of power in the territories of the countries, required for such power trading.

ARTICLE 4

The parties entering into such an agreement for power trade shall be granted all of the incentives and concessions by respective Governments available under relevant laws and regulations of respective countries, for generation and transmission of power.

ARTICLE 5

The parties entering into all such an agreement for power trade shall fulfill all necessary requirements stipulated in relevant laws and regulations of respective countries as well as comply with necessary technical requirements of each country.

ARTICLE 6

Notwithstanding anything contained herein, any country may enter into separate arrangements between themselves or with third countries on power trading for the benefit of their respective countries.

ARTICLE 7

Any difference regarding interpretation and application of this Agreement shall be resolved by mutual consultation among the Governments.

ARTICLE 8

This Agreement shall be subject to ratification and shall enter into force on the date of exchange of instruments of ratification. It shall remain valid for a period of fifty (50) years from the date of its entry into force and its validity shall be extended by mutual consent.

ARTICLE 9

The provisions of this Agreement shall be reviewed at ten (10) years interval or earlier as required by any Government and amended, if required, by mutual consent.
Initialed in _____ on _____ in four (4) original copies in English language.

On behalf of His Majesty's Government of Nepal

_____

On behalf of the Government of India

_____

On behalf of the Government of Bangladesh

_____

On behalf of the Government of Bhutan

_____

Annex 5.2 Inter-Governmental Memorandum of Understanding

WHEREAS, a closer regional power co-operation through a Power Exchange for South Asia for many years has been a priority task for the electricity sub-sector in the region; and

WHEREAS, the national power utilities in South Asia are engaged in the electricity supply business in their own countries; and

WHEREAS, the said utilities wish to continue with the development of interconnections between their respective networks, and expand capacity and energy trade among themselves; and

WHEREAS, the said utilities desire to participate in a regional power exchange under the name of the South Asia Power Exchange (SAPX) to reduce investments and operating costs, enhance reliability of supply and share in the other benefits resulting from the interconnected operation of their systems; and

WHEREAS, the said utilities wish to provide further opportunities to coordinate the installation and operation of generation and transmission facilities; and

WHEREAS, the said utilities' participation in the SAPX shall in no way change the existing relationship between the utility and the Government of the country in which the utility operates.

NOW THEREFORE the Governments who are signatories of this Memorandum of Understanding agree as follows:

ARTICLE 1: PURPOSE OF THIS MEMORANDUM OF UNDERSTANDING

The purpose of this Memorandum of Understanding is to establish a framework under which the signatories pronounce their clear intention to enhance regional power co-operation through the establishment and operation of the South Asia Power Exchange.

The basis for this regional Power Exchange is the need for all participants:

(a) To coordinate and cooperate in the planning and operation of their systems to minimize costs while maintaining reliability, autonomy and self-sufficiency to the degree they desire; and

(b) To fully recover their costs and share equitably in the resulting benefits, including reductions in required generating capacity, reductions in fuel costs and improved use of hydroelectric energy.

ARTICLE 2: DEFINITIONS

In this Memorandum of Understanding, unless inconsistent with or otherwise indicated by the context:

"Member State" means a the government representatives each of which is a member of the South Asia Power Exchange consisting of India, Bangladesh, Nepal and Bhutan;

"Non Member State" means a country that is not a member of the South Asia Power Exchange;

"SAPX" means the South Asia Power Exchange;

"Party" means a Government that is a signatory to this Memorandum of Understanding.

ARTICLE 3: DEPOSITORY OF THE MEMORANDUM OF UNDERSTANDING

3.1 The original of this Memorandum of Understanding shall be deposited with the Coordination Center of the South Asia Power Exchange, which shall act as Depository.

3.2 The Depository shall transmit certified copies to all Parties and shall notify all Parties of further Signatories of this Memorandum of Understanding.

3.3 Any notification or communication in terms of, or in regard to, this Memorandum of Understanding shall be made through the Depository.

ARTICLE 4: AUTHORITIES RESPONSIBLE FOR IMPLEMENTATION

4.1 Each Party shall designate a person responsible for the implementation of its obligations under this Memorandum of Understanding and shall notify the Depository in writing of such a designation.

4.2 If necessitated by circumstances, the persons designated under Article 4.1 by the Parties may consult with each other in regard to any problem arising from the implementation of this Memorandum of Understanding or the performance of a Party's obligations in terms of this Memorandum of Understanding.

ARTICLE 5: AUTHORITY FOR PARTICIPATION

5.1 The intention of each Party is to authorize its national power utility, created in terms of its own legislation, to enter into the necessary agreements that regulate the establishment and operation of the SAPX under the condition that these agreements are subject to the necessary approvals in accordance with the national administrative and legislative mechanisms that regulate the relations between each Government and its respective national power utility.

5.2 The Parties should endeavor to refrain from passing legislative or administrative measures that can prevent its national power utility from fulfilling its obligations to the SAPX.

5.3 The Parties intend to co-operate with and assist their respective national power utilities in the performance and execution of their obligations in terms of any agreement entered into between the respective utilities pursuant to this Memorandum of Understanding.

ARTICLE 6: IMPLEMENTATION

6.1 This Memorandum shall enter into force upon signature by at least three (3) Member States.

6-3 The inclusion of other Non-Member States in the SAPX shall be subject to the approval of the Parties. The terms for such inclusion shall be set forth in separate agreements, which shall form part of this Memorandum of Understanding.

ARTICLE 7: SETTLEMENT OF DISPUTES

Any dispute arising between and among two or more Parties from the interpretation or application of this Memorandum of Understanding that cannot be settled amicably shall be referred to arbitration as agreed upon by the Parties. The ruling given by the arbitrator shall be accepted by the Parties as final and binding.

This Memorandum of Understanding constitutes the entire understanding between the Parties.

IN WITNESS WHEREOF, the undersigned, being duly authorized thereto, have in the names of the respective Governments signed this Memorandum of Understanding.

For the Government of India

For the Government of Bangladesh

For the Government of Bhutan

For His Majesty's Government of Nepal

JOINT DECLARATION OF THE MEMBERS OF THE SOUTH ASIA REGIONAL ENERGY MARKET

On the occasion of the Council of the Members of the South Asia Regional Energy Market on (_____, 2004), and the signature of the Memoranda of Understanding restated below, the signatory State Members of the Regional Energy Market make the following declaration:

The Regional Energy Market is an organization formed through the will of its signatory State Members, indicating their desire and capability to mutually and co-operatively manage and overcome the challenges that are faced collectively in the energy sector.

All signatory State Members, irrespective of their formal designation in the Memorandum, are equal in status and obligation as regards the implementation of the Memorandum. The decisions made in constructing the Regional Energy Market are derived from the will of the signatory State Members, particularly in basing the construction of the Regional Energy Market on a SAARC compatible model, but taking into account regional and local necessities in creating the market. To ensure this compatibility the signatory State Members have associated SAARC at a political level, many discussions with the SAARC technical Committee on Energy have underlined the need to appreciate local and regional issues.

The signatory State Members observe with appreciation the close engagement and strong support of SAARC, which has had substantive contributions since the inception of the process. The continuation of this collaboration is essential, and assistance for the setting up of necessary mechanisms for the smooth functioning of the market is required for the success of the process.

(Signatures)

MEMORANDUM OF UNDERSTANDING ON REGIONAL TRANSMISSION PLANNING

Project Title: Regional Transmission Planning in SAARC Member Countries

Project Purpose: To promote regional cooperation in transmission planning through the development of common transmission planning tools and methodologies in order to improve regional electric planning communications, better understanding of least cost options and produce bankable transmission project proposals with regional economic bodies.

Specific Project Goals:

1. Provide Power System Simulator (PSS/E) Software and appropriate training to each utility transmission planning group with the software and/or the training does not already exist.
2. Create a regional transmission planning group for the purpose of coordinating the regional planning goals, objectives and activities.
3. Convert existing national transmission planning data into a common regional format.
4. Perform certain regional transmission planning studies as defined by the Steering Committee and the Project Coordination Group.

Main Elements of the Scope of Work:

Task I: Transmission Planning Needs and Capability Assessment

- o Identify the transmission system planning capabilities and requirements of each participating transmission utility;
- o Review and utilize findings of existing World Bank and ADB transmission project and other existing information applicable to this project;
- o Design a software and training package purchase that will address the needs of the participants as determined in this task.

Task II: Purchase and Installation of Power System Simulator (PSS/E) Software

o Provide PSS/E transmission system analysis software to each participating transmission utility where it does not already exist after obtaining signed license agreements and payments where required;

o Provide 5 days of training as an introduction to PSS/E Power Flow and Steady-State Analysis and an added 5 days of training as an introduction to PSS/E Dynamic Simulation;

o Work with each participant individually, and collectively as a Working Group, to form existing data and develop new needed data for use with the PSS/E software;

- Construct regional PSS/E transmission planning models.

Task III: Formation of the Regional Transmission Planning Group

o Develop a recommended organization for the Planning Group;

o Recommend staffing and membership criteria;

o Develop responsibility guidelines for the Group including detail on how it will coordinate with the member participants;

o Recommend technology and training needs to assure optimum expertise levels;

o Prepare a transition plan that provides for a smooth transition from this project structure to the on-going coordination by a Regional Transmission Planning Group.

Task IV: Perform Regional Transmission Investment Studies

o Develop power supply and demand scenarios for the region using country specific transmission plans (the many studies that have looked at this issue in recent years;

o Utilize the regional planning models developed in Task /I to evaluate scenarios as proposed by the Project Coordination Group;

o Perform least cost analysis studies to select a limited number of projects for further developments;

o Review the selected studies with international financial institutional experts to assure adequacy of economic and financial considerations resulting in a more bankable projects;

o Prepare final detailed reports for the selected projects;

Project Organization and Implementation:

- The signatories to this Memorandum are the Participating Parties in the Project.
- A Steering Group will provide guidance and overall review of the outputs of the Technical Coordinating Group. It will consist of the following:
  1. A representative from each of the participating and supporting states;
  2. A representative of USAID;
  3. A representative of the SAARC Technical Committee on Energy;
  4. A representative of the World Bank;
  5. A representative of the Asian Development Bank

The Chairman of the Electricity Interconnections Group will lead the Steering Group. The Steering Group will meet at least three times: (1) to initiate the project; (2) to review the interim reports; and (3) to review the final report.

- A Technical Coordinating Group will be established to develop and implement the detailed plan consisting of the following:

1. A designated representative from the participating states representing the Transmission Planning function;
2. A representative of the SAARC Technical Committee on Energy.

Three Working Groups will be established, as shown in attached Exhibit #1, and will meet on or before (insert date).

MEMORANDUM OF UNDERSTANDING ON THE REGIONAL ENERGY MARKET IN SOUTH ASIA AND ITS INTEGRATION INTO THE SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION (SAARC)

Under the auspices and respecting the principles of the Charter of the South Asian Association for Regional Cooperation that has as its core the need to strengthen regional co-operation amongst the states and nations of South Asia and to foster the conditions for peace, stability and economic growth.

The undersigned:

A: as the "Adhering Parties" the Ministers representing:

The Government of India
The Royal Kingdom of Nepal
The Royal Kingdom of Bhutan
The Government of Bangladesh
The Government of Sri Lanka

B: as the "Non-Participating Sponsors"

United States Agency for International Development
World Bank
Asian Development Bank

C: and as the "Observers"

South Asia Forum for Regulation
South Asia Regional Energy Coalition
South Asia Economic Research Institute Network
South Asia Foundation
Recognizing:

- The Second Meeting of the Technical Committee on Energy, held at Dhaka, Bangladesh on December 7 & 8, 2003, regarding the principles, which are set out in the recommendation of the

1st Meeting of the Energy Technical Committee, including (i) the exchange of energy information; (ii) environmentally-friendly energy, creation of a regional power grid among India, Bangladesh, Nepal and Bhutan and (iv) cooperation regarding renewable energy and related statements regarding rural electrification, independent power producers, energy efficient standard setting and labeling of end-use appliances, harmonization of macro policies in the energy sector among the SAARC member countries and the calendar of activities for 2004;

- The need to underpin investment in the region with a firm regulatory perspective into the medium and long-term; and in particular to underwrite the conditions for investment security;

- Having regard to the need to create opportunities for regional trade in energy products and services that may satisfy regional demand and regional supply; and in particular to allow investment security to be enhanced by free flow of goods and services; and to avoid the creation of national, regional or sub-regional monopolies;

- Recognizing the major contribution of the donors in creating the conditions that permit the objectives of this Memorandum to be achieved and having regard to the acknowledgement that solutions to national energy issues based on isolated national markets are neither capable nor desirable as a means to satisfy regional supply and demand imbalances;

- Having regard to the support of SAARC and such other regional planning programs such as SAPTA, SASEC and SARI/E;

- Recognizing that the present document is a document that records political intent alone and provides for no legal commitments with regard to parties, sponsors or observers;

The parties hereby resolve to devote their best endeavors to achieve the following:

1. AN INTEGRATED REGIONAL ELECTRICITY MARKET

To establish an integrated regional electricity market in South Asia by year (____).

This market will be based on the principles set out in the Electricity Act, 2003 of India and other national legislation relating to the operation of the energy market of participating companies, as provided.

The structures and organizations agreed in this memorandum replace those in the SAARC Technical Committee on Energy.

1.1. National Electricity Market Models

Recognizing that in order to achieve the regional approach, it is necessary to establish compatible national electricity market models, the adhering parties will endeavor, where this has not already been done, to create institutions for the operation of an integrated electricity market in South Asia,
namely;

1.1.1. A State Energy Authority

A government body, within a Ministry of an adhering party, entrusted with development of energy policy by (insert date), and which has a primary purpose of ensuring the provision of energy under secure conditions at competitive prices with high levels of public services and consumer protection;

1.1.2. An Electricity Regulatory Authority

The Electricity Regulatory Authorities of the adhering parties, wholly independent of the interests of the electricity industry, by (insert date). They shall at least be responsible for continuously monitoring the market to ensure non-discrimination, effective competition and the efficient functioning of the market, in particular with respect to:

(a) the level of competition;

(b) the rules on the management and allocation of interconnection capacity, in conjunction with the national regulatory authority or authorities of those countries with which interconnection exists;

(c) any mechanisms to deal with congested capacity within the national electricity system including a mechanism to use the collected funds for increasing the capacity where existing capacity is congested;

(d) the time taken by transmission and distribution undertakings to make connections and repairs;

(e) the publication of appropriate information by transmission operator concerning interconnectors, grid usage and capacity allocation to interested parties, taking into account the need to treat non-aggregated information as commercially confidential;

(f) the effective unbundling of accounts to ensure there are no cross-subsidies between generation, transmission, distribution and supply activities. For this purpose they shall have access to the accounts;

(g) the terms, conditions and tariffs for connecting new producers of electricity to guarantee that these are objective, transparent and non-discriminatory, in particular taking full account of the benefits of the various renewable energy sources technologies, distributed generation and combined heat and power.

The Electricity Regulatory Authorities shall at least be responsible for fixing, approving or proposing prior to their entry into force, the methodologies used to calculate or establish the terms and conditions for:

(a) connection and access to networks, including transmission and distribution tariffs; and

(b) the provision of balancing services.

The Electricity Regulatory Authorities shall have the authority to require transmission and distribution system operators, if necessary, to modify the terms and conditions, tariffs, rules, mechanisms and methodologies mentioned above, to ensure that they are reasonable and applied in a non-discriminatory manner.

Any party having a complaint against a transmission or distribution system operator with respect to the issues mentioned above may refer the complaint to the Electricity Regulatory Authority, which, acting as dispute settlement authority, shall issue a decision within a reasonable time.

In the event of inter-regional disputes:

(a) the decisive Electricity Regulatory Authority shall be the Electricity Regulatory Authority covering the system operator, which refuses use of, or access to, the system;

(b) and in the case of a dispute not relating to access a body will be designated, for the purpose of resolving such disputes, by the regulators acting jointly and by unanimity.

The use of any Regulatory Authority shall not prejudice other rights under applicable law.

1.1.3. Transmission System Operators

Transmission System Operators of the adhering parties by (insert date), which shall have the following tasks:

(a) ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity;

(b) contributing to security of supply through adequate transmission capacity and system reliability;

(c) managing energy flows on the system, taking into account exchanges with other interconnected systems. To that end, the transmission system operator shall be responsible for ensuring a secure, reliable and efficient electricity system and, in that context, for ensuring the availability of all necessary ancillary services;

(d) providing to the operator of any other system with which its system is interconnected sufficient information to ensure the secure and efficient operation, co-coordinated development and interoperability of the interconnected system;

(e) the non-discrimination as between system users or classes of system users, particularly in favor of its subsidiaries or shareholders.

Unless the transmission system operator is already fully independent from other activities not relating to the transmission system in terms of ownership, the system operator shall be independent at least in terms of its legal form, organization and decision making from other activities not relating to transmission.

In order to ensure the independence of the transmission system operator, the following minimum criteria shall apply:

(a) those persons responsible for the management of the transmission system operator may not participate in company structures of the integrated electricity undertaking responsible, directly or indirectly, for the day-to-day operation of the generation, distribution and supply of electricity;

(b) appropriate measures must be taken to ensure that the professional interests of the persons responsible for the management of the transmission system operator are taken into account in a manner that ensures that they are capable of acting independently;

(c) the transmission system operator must have effective decision-making rights, independent from the integrated electricity undertaking, with respect to assets necessary to maintain or develop the network;

(d) the transmission system operator must establish a compliance program, which sets out measures taken to ensure that discriminatory conduct is excluded. The program must set out the specific obligations of employees to meet this objective. It must be drawn up and its respect monitored by a compliance officer.

1.1.4 Distribution System Operators

1.1.4.1 Distribution System Operators of the adhering parties by (insert date), which shall have the following tasks:

(a) ensuring the maintenance of and, if necessary, developing the distribution system in a given area;

(b) where applicable its interconnections with other systems; and ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity.

Unless the distribution system operator is already fully independent from other activities not relating to the distribution system in terms of ownership, the distribution system operator within the integrated electricity undertaking shall be independent at least in terms of its legal form, organization and decision making from other activities not relating to distribution. This provision is not applicable if the number of customers served by the Distribution System Operator is below the threshold of (insert number).

1.1.4.2 In order to ensure the independence of the distribution system operator, the following minimum criteria shall apply, as of (insert date):

(a) those persons responsible for the management of the distribution system operator may not participate in company structures of the integrated electricity undertaking responsible, directly or indirectly, for the day-to-day operation of the generation, transmission and supply of electricity;

(b) appropriate measures must be taken to ensure that the professional interests of the persons responsible for the management of the distribution system operator are taken into account in a manner that ensures that they are capable of acting independently;

(c) the distribution system operator shall have sufficient decision-making rights, independent from the integrated electricity undertaking, with respect to assets necessary for the maintenance and development of the network;

(d) the distribution system operator must establish a compliance program, which sets out measures taken to ensure that discriminatory conduct is excluded. The program must set out the specific obligations of employees to meet this objective. It must be drawn up and its respect monitored by a compliance officer. An annual report, setting out the measures taken, must be submitted by the compliance officer to the national regulatory authority.

None of these provisions is applicable if the number of customers served by the Distribution System Operator is below the threshold of (insert number).

1.2. Regional Market Aspects

1.2.1 The adhering parties will take the steps to establish compatible state and regional level action plans, to be coordinated by the Permanent High Level Group, for:

- comprehensive tariff reform,
- the reduction of non-technical losses,
- an increase in energy efficiency necessary to abate demand; and
- the facilitation of sensible energy substitution, whilst maintaining a free market framework.

1.2.2 The adhering parties, aiming at regional investment optimization, the need to attract private capital by ensuring least cost solutions, will, in cooperation with the donors:

- identify infrastructure needs and prepare a prioritized infrastructure plan that would ensure the complementarity of state and regional projects and shall have a regional focus;
- prepare and implement a thermal and hydropower plant rehabilitation plan, that starts from a regional perspective but that has regard to state needs.

1.2.3 The adhering parties, in order to facilitate regional trade on electricity with the objective of making optimal use of regional resources and facilities, will implement trading facilitating mechanisms such as cross border tariffs or systems and congestion management that are

presented by the representative groups of the Transmission System Operators and the Energy Regulators of the adhering parties.

2. FUNCTIONING OF THE MARKET

The adhering parties agree, in order to promote the functioning of effective markets:

(1) To ensure that all non-household customers - eligible customers - are free to purchase from the supplier of their choice by (insert date);

(2) To ensure that integrated electricity undertakings shall, in their internal accounting, keep separate accounts, for their transmission, distribution, generation and supply activities, as they would be required to do if the activities in question were carried out by separate undertakings, with a view to avoiding discrimination, cross-subsidization and distortion of competition. They shall keep separate accounts for supply activities for eligible customers and supply activities for non-eligible customers. Revenue from ownership of the transmission/distribution system shall be specified in the accounts. Where appropriate, they shall keep consolidated accounts for other, non-electricity activities. The internal accounts shall include a balance sheet and a profit and loss account for each activity;

(3) To adopt for the construction of new generating capacity an authorization procedure, which accords authorization if warranted without undue delay; which shall be conducted in accordance with objective, transparent and non-discriminatory criteria. The criteria for the grant of authorizations, in their territories, for the construction of generating capacity may relate to:

(a) the safety and security of the electricity system, installations and associated equipment;
(b) protection of public health and safety;
(c) protection of the environment;
(d) land use and siting;
(e) use of public ground;
(f) energy efficiency; and
(g) the nature of the primary sources;

(4) To avoid imbalances in the opening of the markets, contracts for the supply of electricity with an eligible customer in the system of another country of the region shall not be prohibited if the customer is considered as eligible in both systems involved;

(5) To implement grid codes by (insert date), that have common elements across the region that allow basic operation of the grid and do not discriminate against regional trade; these grid codes shall allow trade on a non-preferential basis and shall be based on best practices and according to the applicable National Grid Codes, as amended. These codes will facilitate and encourage regional trade with the objective of making use of the regional resources and facilities. This task shall be coordinated and agreed among the participating transmission system operators of the Adhering Parties.

(6) To identify all relevant technical norms for the operation of national markets, under the co-ordination and control of the by the participating transmission system operators of the Adhering Parties by (insert date), as it is agreed with these bodies.

(7) With the assistance of SAARC and SAPTA guidelines for inter-country trade and commercial codes, cross-border tariffs and congestion management, with suitable adjustment for national circumstances as the Adhering Parties consider appropriate, by (insert date). They shall apply these guidelines if their responsible TSOs and Regulators give favorable opinions.

(8) To identify a transparent financial settlement systems, assign roles in accountancy and principles for apportioning of cost, and apply international accounting standards (IAS); to develop a system of independent audit; to implement accounts transparency at a level that meets international standards; and in addition adopt best practice on corruption abatement as advised by a reputable international body by (insert date);

(9) To implement an appropriate method for collaboration and information exchange between national dispatch centres by (insert date); to implement the Working Group Plan for Tele-information System among National Dispatch Centres, with the agreement of Transmission System Operators by (insert date).

(10) To implement a system of Regulated Third Party Access to the transmission and distribution systems based on published tariffs, applicable to all eligible customers and applied

objectively and without discrimination between system users. The countries shall ensure that these tariffs, or the methodologies underlying their calculation, are approved prior to their entry into force by the national regulatory authority and that these tariffs are published prior to their entry into force;

(11) Where not covered by the authorization procedure above, to implement a licensing system for all types of infrastructure facilities and for market participation that is transparent, non-discriminatory and in line with international best practice by (insert date);

(12) To adopt legislation on competition that is at least applicable to the entire energy sector by (insert date).

(13) To draw up and agree an action plan on an annual basis for actions to be undertaken on an appropriate basis by each country in a manner consistent with the objective of optimizing the regional electricity system, the first being published in (insert date), and thereafter on an annual basis. In this plan, the Adhering Parties will discuss what might be better achieved at a regional level rather than the state level.

3. GOVERNANCE

3.1 For the governance of the market by (insert date) the parties hereby agree to create:

3.1.1. Ministerial Council

The Ministerial Council, which will take place, at least, annually with the participation of the Energy Ministers of South Asia, in order to take strategic decisions and give guidance to the Forum or, where necessary, to formally endorse conclusions, of the Forum. The Presidency of this Council will rotate, alphabetically, on a six monthly basis, starting with the Presidency of (insert country and start date). The parties invite the Non-Participating Sponsors and the Observers to attend and to take part in these meetings.

3.1.2. The Permanent High Level Group

The Permanent High Level Group, will be composed of representatives of the Energy Ministers of the Adhering Parties. The group shall be convened, when necessary, on the initiative of the Commission and the Presidency in office, in order to prepare the Ministerial Council and to ensure the follow - up of its decisions. The meeting will be co-chaired by the Presidency in Office. In order to ensure close collaboration with other interested parties, the Government representatives of neighboring countries, namely, (insert names) are invited, as observers, at the Permanent High Level Group meetings.

3.1.3. The South Asia Electricity Regulation Forum

The Ministers welcome the establishment of the South East Asia Electricity Regulation Forum. This Forum, meeting at least twice yearly, comprises the representatives of the Commission, Governments, Regulators and Transmission System Operators of the Adhering Parties, electricity companies, representatives of donor countries, and consumers. The Forum is co-chaired by the Presidency in office. The Forum reviews progress in meeting objectives set within its scope and agrees to attribute tasks to different bodies. In order to ensure close collaboration with other interested parties, the Governments, Regulators, and Transmission System Operators of neighboring countries, namely, (insert countries) are invited as observers. The Forum has an identity separate to the existence of this Memorandum of Understanding.

3.2 Donor Coordination

The achievement of the objectives will require close collaboration and involvement of the donors. The Ministers welcome the attribution of the co-ordination role in this respect to SASEC. The Commission intends to carry this out, and donor meetings will, where desirable, possible and/or necessary, be held back-to-back with meetings of the South East Asia Electricity Regulation Forum.

3.3. Secretariat

For all of the bodies described above, the parties request that the Commission acts as an impartial secretariat for their operation.

4. THE ROLE OF SAARC

The Ministers welcome the intention that SAARC Commission has to:

- Undertake a benchmarking exercise annually that shall verify conformity to the Electricity Directive and its derivative legislation, norms and standards, and shall also consult relevant bodies with regard to technical standards. Thus, the report shall be submitted to the Ministerial Council, after it has been discussed at the High Level Group. Where appropriate, the Commission and/or the High Level Permanent Group shall make recommendations for reform.

- Undertake an infrastructure prioritization exercise. The countries of the region commit to co-operate with and positively assist the identification and prioritization of infrastructure projects, to be financed by internal, external and private investors, including international financial institutions. The identification and prioritization process will have a regional focus and shall be conducted by the Commission in conjunction with the High Level Group and the donors.

5. FLEXIBILITY CLAUSE

5.1. The parties to the Memorandum of Understanding understand that the objectives set are ambitious. In this context, where a party may require flexibility in the objectives in order to achieve these, that party shall submit to the Permanent High Level Group, a suggestion for amendment of the Memorandum of Understanding.

5.2. Six months after signature the Permanent High Level Group shall assess and review the commitments within this document and will propose necessary amendments in line with commitments made within other processes.

5.3. Six months after signature the Permanent High Level Group shall assess the commitments within this document with the view to proposing a legally political binding document.

6. DEFINITIONS

Unless otherwise stated, the terms within this document have the meaning ascribed to this in the applicable legislation governing the Adhering Parties.

7. INTERNATIONAL LAW

This Memorandum of Understanding does not constitute an agreement that is binding under international law. The adhering parties, sponsors or observers do not intend to create legal commitments.

8. FUTURE LEGAL STATUS

The Adhering Parties will investigate the necessity of providing a legal basis for their co-operation and call upon SAARC to prepare a report for (insert date) that will address this issue.

9. ENVIRONMENTAL ISSUES

The Adhering Parties take note of the need to address environmental issues across the energy sector and call upon SAARC to prepare a report for (insert date) that will address this issue. The parties consider that the Kyoto Protocol provides a basis for future investigative discussions.

SIGNATURES

As Adhering Parties:

As Non-Participating Sponsors:

As Observers: